Smoking-fast wireless LANs: A first look at 54M bit/sec 802.11a access points. PAGE 55.

ComNet action: Show to feature switch upgrades from Foundry; Avaya to meld voice and IP VPNs. PAGE 8.

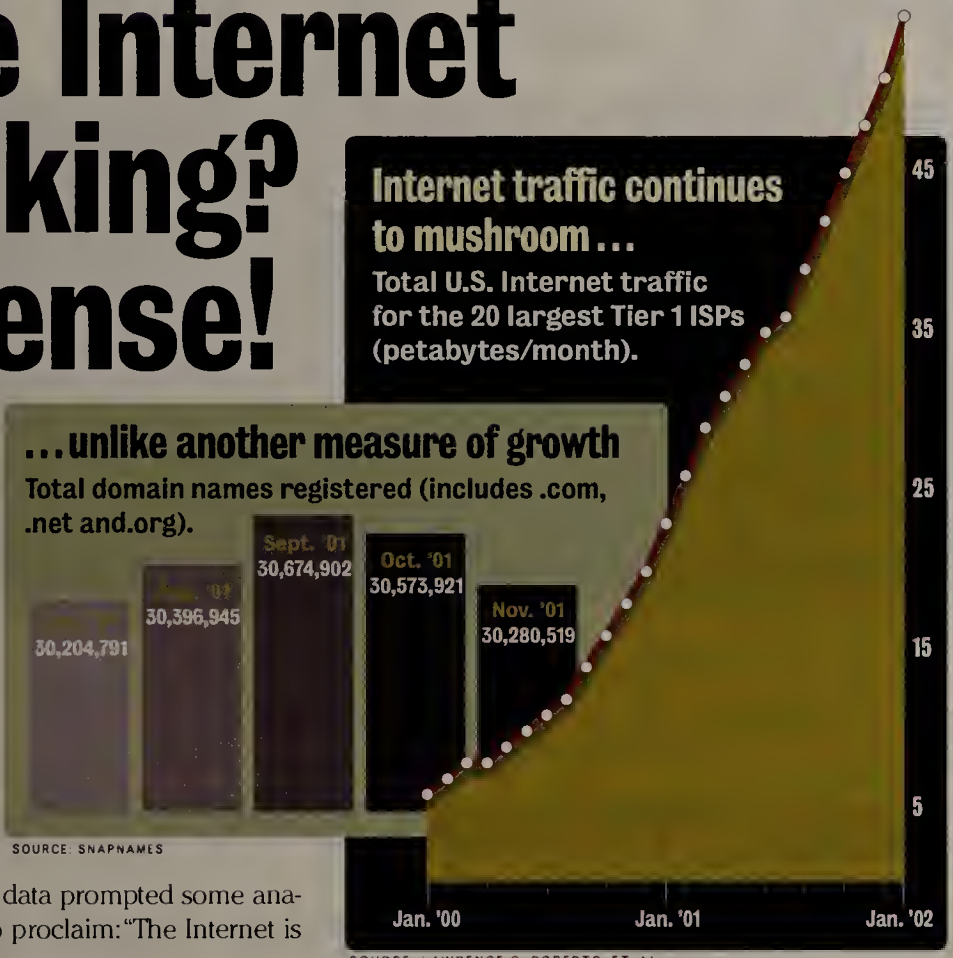
NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

January 28, 2002 ■ Volume 19, Number 4

Is the Internet shrinking? Nonsense!

■ BY CAROLYN DUFFY MARSAN



Internet traffic continues to mushroom … Total U.S. Internet traffic for the 20 largest Tier 1 ISPs (petabytes/month).

… unlike another measure of growth Total domain names registered (includes .com, .net and.org).

SOURCE: SNAPNAMES

SOURCE: LAWRENCE G. ROBERTS, ET. AL

Domain name registrations dropped for the first time in the history of the Internet during the fourth quarter of last year. Combined with high-profile dot-com failures, telephone company troubles and widespread layoffs, the domain name data prompted some analysts and media outlets to proclaim: "The Internet is shrinking!"

It's a great headline, but the "incredible, shrinking Internet" is a myth. By every measure of a network's health — users, connected systems, traffic and applications — the Internet continues to expand at an unprecedented rate. And corporate usage is prompting most of that growth.

"Corporate Internet traffic is not only growing, but growing exponentially," says Elliot Noss, CEO of Tucows, a Canadian domain name registrar. "As we continue to move toward multimedia … we're talking about continued exponential growth."

See Shrinking, page 76

Behavior blocking repels new viruses

■ BY ELLEN MESSMER

The future of computer viruses seems clear enough: ever more destructive "hybrid worms" that take advantage of software vulnerabilities and destroy files, leave behind holes for hackers to exploit, then scan for new victims at lightning speed.

Viruses such as last year's Code Red and Nimda are overrunning traditional antivirus software and intrusion-detection systems.

These products require updated "signatures" to detect and stop most new viruses, possibly leaving a several-hour window when even the best-prepared organizations are at risk.

Although antivirus software vendor Sophos identified 1,000

See Antivirus, page 77

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Using Linux to get easier

Show to feature migration, mgmt. tools.

■ BY PHIL HOCHMUTH AND DENI CONNOR

NEW YORK — A host of big-name vendors this week will air servers and applications aimed at handling heavier Linux workloads as well as tools for managing what some users are calling "unwieldy" open source systems.

At the LinuxWorld Conference & Expo — expected by organizers to draw less than the 25,000 attendees who showed for the San Francisco edition last August — Compaq, Computer Associates, IBM, Intel and Hewlett-Packard will be among more than 100 vendors touting their wares. Red Hat, BMC Software and HP will be among the many companies announcing services and products for helping customers install and manage Linux systems, or to migrate to Linux servers from Unix systems or proprietary mainframe platforms.

"Every year, the number of Unix systems that can be replaced by Linux grows," says Michael Tiemann, CTO of Red Hat. "First it was file and print, then Web. Now we're well into the middle tier of enterprise servers."

Red Hat will introduce its Network Workgroup service, which includes software that can tie together multiple Linux servers to be managed as a group. The service also provides access to the Red Hat Network, an online management service that automates software updating, security-alert monitoring and software patch distribution.

BMC is announcing eight products that will let administrators make predeployment decisions regarding Linux server installations or migrations from other server platforms. Among the packages are Patrol for Perform, Patrol for Predict and Configuration Manager for Linux, all of which are used to evaluate workload, capacity and underlying hardware requirements of supported applications. Data collected on current systems with the BMC software could be used by businesses to help avoid surprises

See Linux, page 13

Open Source Evolution

First in a two-part series

Despite the hype and the fears, Linux and open source software continue to barrel headlong into enterprise environments. The fact that IBM, Hewlett-Packard and other big-name vendors are betting heavily on Linux makes the leap a little easier. And then of course there's the savings.

Page 12

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First look
A new generation of wireless LAN access points has hit the market, and we've got a first look at three leading-edge products. These 802.11a access points are five times faster than the 802.11b products that have been out for the past year or so. **Page 55.**

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Dongle dilemma
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NetSmart partnership
LearnKey and *Network World* now partner to offer IT training courses and certification exam simulations. Buy one LearnKey OnlineExpert Web-based training course at list price and get a second course of equal or lesser value free until Jan. 31. **DocFinder: 7757**

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News Bits

Effort afoot to standardize mobile transactions

■ A consortium of companies, including technology heavyweights Sun, Hewlett-Packard, Lucent and Oracle, have teamed to create standards for the way transactions originating on mobile devices are handled, a move that the companies hope will remove barriers to widespread mobile commerce. The consortium, called PayCircle, was publicly announced last week. The payment, transactions and authorization component of mobile commerce currently is being held back because there are no standards and many different systems do not necessarily work together, according to Malcolm Lewis, director of mobile offer management at Lucent. PayCircle will attempt to correct that problem by creating standard interfaces by which payment systems, wireless networks and vendors can communicate, he says.

Alcatel snaps up Astral Point

■ Alcatel announced last week it will buy privately held Astral Point for about $135 million. Astral Point's products help fill several holes in Alcatel's line, such as next-generation SONET transmission products, and its need for a small, scalable SONET add/-drop multiplexer and cross-connect designed specifically for metropolitan applications. Under the terms of the agreement, 9 million Alcatel shares will be exchanged for the stock of Astral Point. The transaction is expected to close by the end of the first quarter. Alcatel plans to integrate Astral Point into the optics business of Alcatel USA.

Netscape files suit against Microsoft

■ Netscape Communications, a subsidiary of AOL Time Warner, last week filed a lawsuit against Microsoft alleging that the software maker harmed Netscape with anticompetitive practices related to the Windows operating system. Netscape argued in its lawsuit that Microsoft's anticompetitive practices, long the subject of a federal antitrust case, "resulted in harm to competition and antitrust injury to Netscape in particular." Microsoft declined to comment on the lawsuit in detail, but says it was disappointed with AOL's course of action. "The company has been using politics and legalese to compete against Microsoft for years. It's our feeling that this is just the next tactic in their plans," a spokesman says.

Woz has a new company cooking: wOz

■ Half of the team that helped launch the PC revolution — Apple co-founder Steve Wozniak — is bringing a new company to the high-tech world. Wozniak, who co-invented Apple's line of Apple I and Apple II computers with Steve Jobs, is starting a company called Wheels of Zeus, or wOz (a play on his nickname). Details about what the company will do are hazy, but a statement issued last week cites technologies such as Global Positioning Systems and inexpensive wireless access and processing power as being central to the plans.

Wheels of Zeus is backed by $6 million in venture capital funding from Mobius Venture Capital, Draper Fisher Jurvetson and Palo Alto Investors.

Steve Wozniak will try to recreate the results of his first foray with a new company called wOz.

■ The Good The Bad The Ugly

JAY BEVENOUR

Giving hope to dot-coms everywhere, Amazon.com last week reported its first-ever profit, earning $5 million in the fourth quarter.

Only about one-third of 230 organizations surveyed have a plan for complete loss of physical assets, according to Gartner and the Society for Information Management.

WorldCom Vice Chairman John Sidgmore, speaking at last week's SuperNet conference in San Jose: "Two or three years ago we were all geniuses, and now we're all idiots." ➤

New Solaris 9 beta made available

■ Sun released an updated beta-test version of its Solaris operating system last week with new features such as resource management, integration of the iPlanet Directory Server, security enhancements and Linux interoperability capabilities. Resource management in Solaris 9 lets administrators assign to applications a specified amount of system resources, such as CPU time and virtual memory, to improve utilization and assist in capacity planning. Addition of the iPlanet Directory gives administrators better control over users and access to system data. Open source commands, libraries and utilities let Linux programs run virtually unaltered on Solaris 9.

Sun claims that 10,000 users have downloaded the software since a developer edition was first made available in October. Solaris 9 Early Access is available at http://sun.com/solaris/programs/solaris9ea and is expected to ship in the first half of this year.

MSPs SevenSpace and Nuclio join forces

■ Management service provider industry pioneers SevenSpace and Nuclio last week announced they will merge in an effort to offer customers a broader range of remote management services.

The combined company, SevenSpace/Nuclio, will offer the application management services of SevenSpace with the network, systems and server administration management capabilities Nuclio provides. SevenSpace CEO Peter Weber will serve as CEO of the joint company.

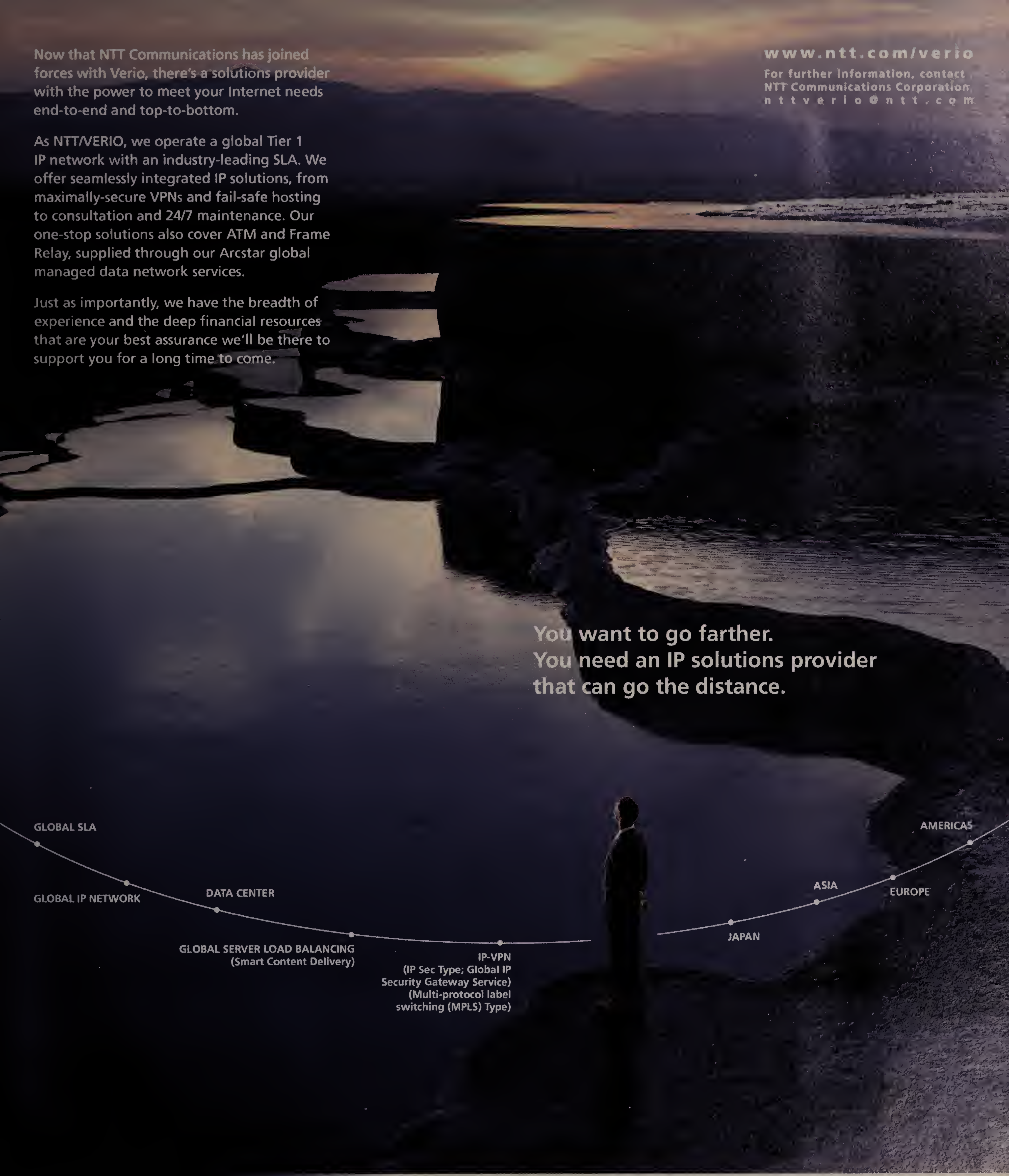
Baltimore, Clearswift strike deal

■ Baltimore Technologies has entered into an agreement with Clearswift, a software company based in the U.K., to sell its content security business for $30 million. The sale would mean Baltimore would no longer sell the MimeSweeper product it acquired in its merger with Content Technologies, but concentrate on authentication and authorization products.

AT&T sheds part of hosting business

■ Web hosting service provider Interland announced late last week it is buying AT&T's small business Web hosting customer contracts in a deal valued at up to $12 million.

While Interland would not comment on how many AT&T customers it is purchasing, IDC analyst Melanie Posey estimates that there are about 7,000 to 8,000 customers moving over. The deal means AT&T will no longer offer its Small Business Hosting Service and Business Ready Dedicated Hosting Services. AT&T says these services represented a small amount of its overall Web-hosting service revenue as the offerings cost $25 and $795 per month, respectively.



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Foundry aims to boost BigIron switches

Separately, Enterasys ready to release network management software.

■ **BY PHIL HOCHMUTH**

WASHINGTON, D.C. — Foundry Networks and Enterasys Networks will unveil switch modules and network management software respectively at the ComNet 2000 show this week.

While Foundry's new modules for its BigIron switch will lean more toward carrier customers, companies with BigIrons in the backbone could benefit from the blades' improved port density. Separately, Enterasys' new software is aimed at corporations that want to base network configurations such as quality of service and user access rights on business policies.

Foundry is increasing the performance of its carrier-focused BigIron switch with modules similar to the high-density 10/100M bit/sec and Gigabit Ethernet modules it announced for its FastIron line earlier this month.

While the BigIron has been an enterprise backbone and data center switch and an aggregation box for metropolitan-area network (MAN) service providers, Foundry is aiming the new BigIron modules squarely at carriers, with features such as per-port rate limiting and traffic accounting, Multi-protocol Label Switching (MPLS) and support for carrier-size Layer 2 VPNs.

New for the BigIron 4000, 8000 and 15000 will be:

- A one-slot, eight-port, mini-gigabit interface card (GBIC) module.
- An eight-port, one-slot management module.
- A 16-port copper Gigabit and mini-GBIC module.
- A single-port 10 Gigabit Ethernet module.
- A 48-port, single-slot telco module, and dual-slot RJ-45 10/100 module.

The modules are based on Foundry's JetCore ASIC, which can perform the job of nine of Foundry's previous-generation IronCore chips, the company says. This lets customers pack more ports into tighter spaces. The BigIron switches can now accommodate up to 232 Gigabit Ethernet ports or 672 10/100 Ethernet ports, double the previous maximum port counts.

Adding JetCore modules to the BigIron line puts the switch family on par with Foundry's FastIron switch line. What makes BigIron different from its enterprise-targeted cousin are carrier-specific features in its modules, such as MPLS support, enhanced Spanning Tree Protocol features for support of Layer 2 metropolitan networks and increased memory on the modules for faster Layer 3 lookups.

With MPLS, Foundry is setting up BigIron to operate as a Layer 2 VPN service provider box. In a Layer 2 VPN service, a carrier tags customer traffic with an MPLS label at a customer site, then routes the traffic as part of a "private" circuit over MPLS-enabled routers inside the carrier's network. The MPLS feature was previously available only on Foundry's NetIron core Internet router.

The new BigIron modules also will include a proprietary version of the Layer 2 Rapid Spanning Tree Protocol called SuperSpan, which beefs up Layer 2 and virtual LAN technologies used in LANs to support a carrier-sized customer base. SuperSpan lets carriers delineate their customers based on VLAN tags, then combine VLAN groups of metropolitan-area customers.

Having the JetCore ASIC on Foundry's two major switches could strengthen the company's position in the enterprise and carrier MAN markets, says Joel Conover, an analyst with Current Analysis.

"That ASIC puts Foundry on par in terms of functionality with most of what their competitors are offering," Conover says. "That wasn't true a year ago."

The BigIron switch will compete with Cisco's Catalyst 6500 and Extreme Networks' BlackDiamond in the enterprise market, and Riverstone Networks' RS38000, Cisco's 7600 and Extreme's Alpine switch in the MAN service provider market. The modules will be available in March and cost between $190 per 10/100 port and $800 to $1,000 per Gigabit port.

Enterasys to air tools

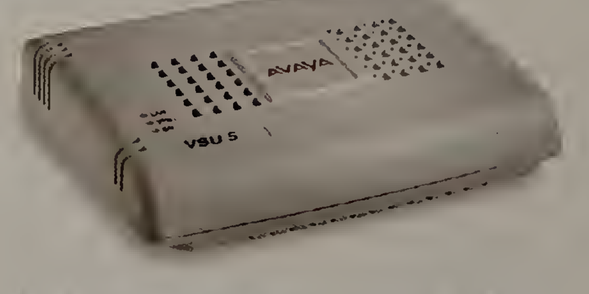
On the software front, Foundry switch rival Enterasys will announce NetSight Atlas, a set of advanced system-level management tools. The software can be used to correlate network management and switch configurations more closely with business rules, such as user access and departmental priorities.

NetSight Atlas is an extension of the company's User Personalized Network (UPN) architecture, which it introduced last year. UPN technology was Enterasys' entry into policy-based switching with its NetSight Policy Manager, which enforces network resource rules and user access at the switch level instead of the server level. Pricing has not been released for NetSight Atlas. ■

Avaya to meld VPNs and VoIP

New gateways to prioritize voice on VPN links.

■ **BY TIM GREENE**



Avaya's VSU-5 is designed to protect small offices with a firewall and VPN.

WASHINGTON, D.C. — Avaya will make a splash this week at ComNet 2002 by pushing voice capabilities into a small-site IP VPN appliance, a move that could help enterprise customers save money on branch-office telephone bills.

By identifying voice packets and tagging them for top priority, the new VSU-5 sets the stage for tying phones in small offices or even telecommuter offices to corporate PBXs via secure VPN links. This support would give remote offices PBX phone features and access to the public telephone network over PBX trunks to a local phone carrier. Regular phone lines to remote offices could be reduced or eliminated, a potential money saver.

Other vendors, such as Cisco and NetScreen Technologies, can prioritize voice packets through their VPN gear as well. Avaya says it preconfigures VSU-5 and a larger new VPN appliance called VSU-10000 to support IP phones made by Avaya and Cisco. This ensures that VPN gateways recognize prioritization tags that the phones place on the voice packets without further configuration.

Marking packets for priority requires that each device along the way follows the prioritization scheme. So, for instance, a DSL router or cable modem that sits between a VSU-5 and the Internet would have to enforce the priority tag set by the VSU-5 in order to avoid delay. If it didn't, the packets would be treated as any others, subjecting the stream to delays or loss. Perhaps because of these hurdles, most users are not attempting to run voice over VPNs today, says Jason Smolek, an analyst with IDC.

But that will change, says Dave Kosiur, an analyst with The Burton Group. "Voice over VPNs is something that will become more important over time as users start to run voice and data over the same line," Kosiur says, but right now, that is not a priority among VPN users.

In considering convergence of voice and data on VPNs, users should be aware that the reliability of an IP voice network might not be on par with that of traditional public phone networks. So if they use the voice-over-IP option, they might want to keep a regular phone line to use in case of an IP outage, Kosiur says.

With 2M bit/sec of Triple-DES throughput and support for five users, VSU-5 is designed for home offices or small offices that have DSL or cable-modem Internet connections. It has two 10/100 Ethernet ports to connect to the LAN and the remote access device, and supports PPP over Ethernet.

To run voice over the VPN, IP phones would be plugged into branch-office LANs and would connect over a VPN link to an Avaya Definity PBX at a headquarters site. From there, calls could be routed to other phones on the corporate network or to the public phone system.

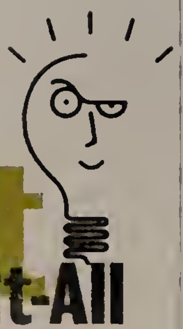
VSU-10000 is a large gateway designed to handle traffic from other VSUs or VPN remote clients. VSU-10000 encrypts VPN traffic at up to 400M bit/sec and supports 10,000 concurrent VPN sessions.

Later this year VSU-10000 will be upgraded to allow strapping two together so if one fails, the other picks up the VPN traffic. "Failover is particularly key if you are going to pass phone traffic," Kosiur says.

Avaya is also upgrading its VPN client so it is easier to distribute policies. But it still lacks automatic policy updating each time a user logs on, Kosiur notes.

VSU-5 will be available in March and cost $800. VSU-10000 will cost $40,000 and be available next month.

Avaya: www.avaya.com



Be a Net Know-It-All

■ THIS WEEK'S QUESTION:

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AT&T spells out international strategy

■ BY DENISE PAPPALARDO AND JENNIFER MEARS

AT&T revealed plans last week to offer a set of managed services worldwide to counter the imminent demise of Concert Communications, its international joint venture with British Telecom.

The telecom giant announced its blueprint for offering customers around the world the same fully managed services it has offered in the U.S. AT&T classifies its managed service offerings into three categories: Enterprise VPN Services; Hosting Services; and High Availability and Security services.

"We are reinforcing our commitment to customers that we will deliver services and solutions globally across a single integrated network, not just domestically in the U.S.," says David Dorman, president of AT&T.

AT&T is combining products and services from previous partnerships and acquisitions, including Concert and the IBM Global Network, and fine-tuning these assets to offer managed data services, Dorman says. "We had a set of capabilities before, but we haven't coherently articulated those."

AT&T is addressing problems it had with Concert, which included its inability to package AT&T and BT services cohesively, says Brownlee Thomas, an analyst with Giga Information Group. "AT&T's hands were tied because it was also not able to sell directly to business users in Europe and the U.K. under the Concert agreement."

> “We are reinforcing our commitment to customers that we will deliver services and solutions globally across a single integrated network, not just domestically in the U.S.”
>
> **David Dorman**
> President, AT&T

The company plans to offer multinational business users the same services overseas as it does in the U.S., she says. AT&T will offer international customers the same IP VPN and its Multi-protocol Label Switching (MPLS) IP-Enabled Frame Relay services. It currently offers its fully managed IP VPN service in 54 countries, but is only able to support MPLS service in a handful of cities worldwide.

AT&T is investing $300 million building out 80 additional switching nodes and upgrading facilities overseas. The service provider has upgraded between 12 and 20 switching facilities in Europe to support its MPLS offerings, but expects to have 80 sites upgraded by year-end. The company's legacy IBM data network spans 849 cities in 60 countries.

The service provider also is investing $200 million to expand Integrated Global Enterprise Management System (IGEMS), its enhanced management platform, which has been reserved for the company's largest customers that bought customized services through its AT&T Solutions division.

The stretching of IGEMS across AT&T's network and to all managed service customers will let them access a single Web portal to view reports and monitor performance for all their AT&T managed services by year-end, the company says.

The AT&T Managed Services Portal for IP services was launched in September and eventually will include all the company's managed domestic and international service offerings.

Concert will be dissolved fully by the end of the first quarter, which is ahead of schedule, Dorman says.

AT&T: www.att.com

Compaq thinks thin with new processor server

■ BY APRIL JACOBS

Targeting DNS server, firewall and small Web server duties, Compaq this week will roll out its single processor server blades, the first in a family of such products the company will debut.

Customers will be able to pack up to 280 of Compaq's low-end BL10e-Class blades into a chassis that typically would accommodate 42 single rack-unit 1U (1.75-inch-high) servers. Software will let customers with multiple blades provision processor-power on the fly, letting them meet peaks and valleys in demand for applications — something traditionally available only in high-end Unix systems and mainframes. Such flexibility could save companies money on hardware and software.

Small package

Compaq this week will introduce its BL10e server blades, which feature:

- Onboard management tools for controlling capacity.
- A single low-voltage 700-MHz Pentium III processor.

The BL10e starts at $1,800; a bundle of 10 blades costs about $17,000.

Compaq expects to announce later this year a higher-end blades, the multiprocessor p-Class, aimed at applications in the data center that require more transaction processing power.

Compaq's blade strategy has significant differences from that of current rival, but potential mate, Hewlett-Packard. While Compaq's blades are straightforward servers, HP takes a more comprehensive approach through partnerships to provide blades that will offer storage, network and application-specific gear. Also, while Compaq's blades are Windows and Intel-centric, HP plans to offer server blades with Pentium III, PA-RISC and Itanium processors, and support Linux, Windows and HP-UX. Initially, HP will offer blades with Pentium processors and the Linux operating system. HP's blades will support SCSI and Fibre Channel storage. The companies have not said how they will reconcile the two strategies.

Compaq also is releasing a stand-alone thin server, the DL360. The single rack-unit device will have an integrated Lights-Out Management processor that until now was sold separately on a network interface card. The processor lets customers reboot and troubleshoot a server from a remote location.

The processor is included in the first ProLiant Essentials Value Pack for the DL360 thin server. The offering includes software designed to help users configure, maintain and manage their servers.

Modules include:

- The Integrated Lights-Out Advanced Pack ($400) — shipping with the ProLiant DL360, which is priced at $2,680.
- The Rapid Deployment Pack, which lets customers replicate system configurations across ProLiant servers ($120 single license, $1,190 for 10 licenses).
- The Workload Management Pack, software that lets users allocate CPU, memory and storage for multiple applications running on four- and eight-way ProLiant servers running Windows 2000 ($1,875).

Compaq: www.compaq.com

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Linux barrels deeper into the enterprise

■ BY PHIL HOCHMUTH

Open Source Evolution
First in a two-part series

By now the Linux story is well-known: A university student's computer project evolves into Internet-based software development phenomenon, the software becomes a legitimate Microsoft/Unix threat, is overhyped by industry watchers and overvalued by Wall Street. Then reality sets in, and small companies that had invested heavily in the technology crash along with the rest of the high-tech world.

End of story? No, really only the beginning.

Despite the hype and the fears, Linux and other open source software have made serious gains in corporate IT shops. The strength of the technology is real, enterprise users and analysts proclaim, and vendor giants such as IBM, Hewlett-Packard and Compaq are betting heavily on Linux and investing billions of dollars in open source software development to make it even stronger. And more is on the way, from the enterprise-class products coming at this week's LinuxWorld show (see related story, page 1) to improved symmetric multiprocessing (SMP) support that could come in the next year.

The potential to save money is a driving factor behind companies' plans to implement Linux, or at least evaluate it as an alternative to Unix-based enterprise servers. A recent IDC study shows that a company with 1,000 users can save around $307 per year, per seat by running Web, intranet and extranet applications on Intel-based Linux servers over Unix servers based on Reduced Instruction Set Chip (RISC) processors — such as HP's PA architecture or IBM's RS6000.

The research firm says that companies can see even bigger savings — $1,142 per user, per year — by migrating from Unix to Linux when running collaborative applications, such as groupware programs or custom-developed enterprise applications. IDC says customers making the switch to Linux could see savings in hardware costs (because Intel-based servers are less expensive than RISC-based machines) and software licensing costs (because Linux doesn't have any).

And real-world savings are showing up on corporations' bottom lines when moves are made from proprietary to open source.

Amazon.com recently reported in Securities and Exchange Commission documents that it cut its IT expenses from $71 million to $54 million by switching out its Unix-based Web infrastructure with servers running Linux and Apache Web server. This 25% IT cost savings could be seen as one factor that helped the online retailer to see its first net profit ever — $5 million for the fourth quarter — which it reported last week.

Cost savings aside, the real strength of Linux and open source software, others say, is the solidness of the code.

"Linux is very stable and reliable," says Bill Claybrook, an analyst with Aberdeen Group. "That's been the biggest selling point for it. Cost was really down the list for many users when it comes to Linux."

Apparently many customers agree, as data from the Netcraft Internet research site in December shows that 56% of the Web sites on the Internet use the open source Apache Web server vs. 29% run by Microsoft's Internet Information Server (IIS) and 3.5% running AOL's/Sun's iPlanet server.

As far as replacing NetWare or Windows NT servers on the low end, Claybrook says the hardware savings users would see in a Linux migration would be nil, because Intel architecture is the predominant platform for low-end and midrange systems.

Reliability is what gives open source software such as Linux, Apache and the e-mail program Sendmail a good reputation, says Patrick Olson, CIO of Menlo College in Atherton, Calif.

"I have no problem with Microsoft on the client side," Olson says, "but in the server room they don't have a good reputation and never have. Everyone who runs servers knows this."

Olson has been pleased with the migration from a Microsoft-based e-mail server to Linux and Sendmail. He adds that open source software seems to be less susceptible to viruses, such as the Code Red worm, which targeted IIS Web servers last summer.

One development that has been the most promising sign for the success of enterprise open source software is the chummy relationship that has evolved between Linux and IBM. The company last year ported Linux to every line of server it makes, from single-processor Intel boxes to the S/390 mainframe. In fact, 11% of IBM's mainframe million-instructions-per-second processor shipments last quarter were for Linux-based systems. Big Blue has spent more than $1 billion developing Linux, focusing on the areas of software development, such as expanding and strengthening Linux support for all of IBM's server hardware platforms and contributing to Linux kernel improvements.

"If you look at 2001 from last January to now, we saw Linux in the enterprise go from proof of concept to production," says Dan Frye, director of IBM's Linux technology center. "We have close to 300 people working in open source at IBM." He says that number has grown quickly from the group of 10 Linux people he had two years ago.

Some analysts have criticized IBM's perceived overzealous embrace of all things open source, saying the IT behemoth could risk alienating the open source community on which it relies by trying to make Linux its own vehicle for selling hardware. This could also be said for Linux server vendors — including Dell, Compaq and HP — which have become the hardest-charging Linux backers over the past few years.

This vendor enthusiasm for Linux has helped to make it a viable enterprise technology, where smaller firms such as VA Linux Systems, Red Hat and Caldera failed in that effort.

Part of the increased interest in Linux as an enterprise platform is because of improvements made in the operating system's kernel — or core software components — which were released last year, according to Michael Tiemann, Red Hat's CTO. Among the improvements were expanded SMP support to eight processors, a boost in the amount of memory a Linux processor can handle (now 2G bytes) and the addition of a journaling file system, a feature common on large Unix systems that can prevent the loss of data in the event of a server crash.

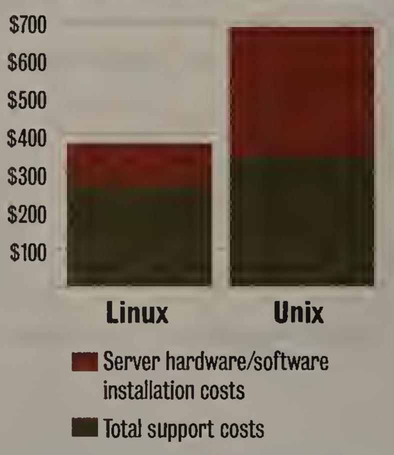
Tiemann says SMP scaling must be improved further. For this, work on the kernel continues at Red Hat and in the open source community that could result in great leaps in Linux SMP support in the next six to 12 months. Part of the effort is the development of a new kernel scheduler (the piece of code that controls what jobs an operating system does, and when), which could allow exponential jumps in SMP support, Tiemann says.

"I'm bullish that some of the things we're doing will let Linux go from eight, to 32 to 64 processors in a machine," he says. ■

Comparing costs

According to IDC, a company with 1,000 users could save 44% by running Linux instead of Unix for certain applications.

Total one-year cost of ownership



Notes: All costs are on a per-user basis. Based on a survey of 142 businesses running Linux or RISC/Unix servers.

QUICKTAKE

RSA Security's SecurID ComboReader

The ComboReader is really two network security products in one. Measuring a scant 2 inches long, it can be used just like RSA's SecurID hardware token normally would be to generate one-time passwords. But it's also a mobile smart-card reader, which comes with a Universal Serial Bus or serial connector cable, to make use of standard smart cards, such as RSA's public-key-based cards. The ComboReader costs $66, the same as a single SecureID hardware token.

RSA: www.rsa.com

Corrections

■ In the story "Net mgmt. barrage set for ComNet" (Jan. 21, page 1), Apogee Networks was misidentified. Also, the full name of the Teltronics' product is the Site Event Buffer enterprise agent (SEBea).

■ In the review on IP videoconferencing services (Jan. 21, page 49), it was found in a retest that NetMeeting is fully functional over WireOne's Glowpoint network, provided that all endpoints are registered with the gatekeeper. We also could add data to a videoconference between two iPower 960 systems. The scorecard for WireOne in the data conferencing category has been changed from a 1 to a 5, giving Glowpoint a final score of 4.7 and a World Class Award.

Linux

continued from page 1

when installing Linux servers for the first time or moving from one platform to another. Such pitfalls could include performance slow-downs under heavy loads or incompatibility with custom-built applications.

Looking to help companies devise a Linux plan, HP is launching its Global Deployment Services for Linux. The service can help companies pick what systems are right for migrating from Unix to a less-expensive Linux system, and how to port applications and convert information such as user databases, network file systems and storage, HP says. The service provides companies with advice on where to use Linux, as well as installation, testing and post-installation support of Linux servers.

Kicking off several high-end Linux mainframe and clustering announcements, IBM will roll out a Linux-only mainframe. The all-Linux mainframe could be used to consolidate servers in a corporation, and will cost less than IBM's traditional mainframes. Previous mainframe support for Linux involved running Linux server images on top of a mainframe's OS/390 operating system.

Part of BMC's multiproduct announcement will include tools for migrating software to IBM eServer zSeries (formerly S/390) servers running Linux. Also, Serena Software will announce IBM zSeries support for its ChangeMan product, which manages the deployment and installation of enterprise applications over a network.

On the clustering front, Platform Computing will announce its Clusterware for Linux, an installation, configuration and management package for Linux clusters. Clusterware lets system managers allocate resources such as CPU utilization, monitor and configure workloads, and measure the performance of the cluster.

With lots of hardware horsepower and management products on hand, the show also will feature vendors with plenty of applications for Linux.

"In this day and age, if you are a software company and you are serious about it, you are making provisions to support Linux," says Evan Quinn, an analyst with Hurwitz Group. This is a different story from a few years ago, when one of the biggest knocks on Linux was the lack of application support.

Sun will announce that its iPlanet Application Server, an e-commerce development platform, will work on Linux servers.

CA will announce that its ACCPAC accounting system for midsize to large corporations has been ported to the IBM DB2 database for Linux.

Jim Kirwan, an IT consultant, has installed ACCPAC on Red Hat Linux in telecom company Future Communications' offices, where more than 45 local and remote employees will access it and send mission-critical financial information from their point-of-sale systems. Kirwan, who has no previous experience with Linux, says Future chose Linux because it was inexpensive for cost-conscious retail environments to implement and easy to install.

Linux desktop company Ximian will be showing its latest Evolution desktop environment for Linux, which provides a graphical user interface as well as management tools and software-updating tools.

While interest in Linux on the desktop has lagged compared with the server version of the operating system, it has garnered some attention.

"My plan is to configure [our] workstations so that all Internet applications will run under Linux for security reasons," says Robert Cole, system administrator at Zila Pharmaceuticals in Phoenix, which uses Ximian's desktop products. Cole expects to see fewer viruses on Linux because most malicious programs are Windows-based.■

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Slump pervades SuperNet 2002 show

Vendors use conference to reassure audience rather than reveal many new products.

BY JIM DUFFY

JASON GROW

> **“Clearly, we all know the bubble has burst. But the Internet is not dead.”**
>
> **Judy Estrin**
> CEO, Packet Design

SANTA CLARA — Vendors used last week’s SuperNet 2002 conference to reassure skittish customers, suppliers and investors that they are still committed to IP and the Internet despite the telecom slump.

Equipment and service providers at the broadband-focused event spoke of brighter days ahead, when spending would pick up, revenue would grow, and IP would attain the reliability and quality-of-service (QoS) capabilities of legacy service infrastructures. Their words echoed in half-empty conference rooms at the show, which also featured an eerily inactive exhibition hall.

“Clearly, we all know the bubble has burst,” said Judy Estrin, CEO of start-up Packet Design, a developer of technologies and incubator of companies to help scale the Internet. “But the Internet is not dead.”

Estrin spoke on a panel discussing the future of the Internet as a viable tool for business transactions and communication. Other panelists included officials from Cisco, Unisphere Networks, Sprint and secretive router start-up Procket Networks.

All sought to persuade attendees that IP and the Internet — with some modifications — can be harnessed to handle important business applications. Estrin sought to debunk common myths that IP cannot scale, is inadequate for converged voice/data/video applications and presents a security threat via denial-of-service attacks.

“Every network has its vulnerabilities,” she said. “Hackers are taking advantage of IP’s distributed architecture. You have to learn to use routing to your benefit rather than for hackers to attack you.”

Technologically, “IP can get us there,” Estrin said. But service providers have to develop business models that help pay for infrastructure expansions and remove obstacles — such as real or perceived security and privacy threats — to consumers’ rapid absorption of IP and Internet applications.

“Consumer access is key to the next wave of growth,” she said.

Also key to the growth and acceptance of IP services and service infrastructures are improvements in QoS and service-level agreement (SLA) capabilities. IP services are but a small slice of carrier revenue — they accounted for less than 10% between 1999 and 2001, according to Current Analysis — but are expected to be a more significant contributor in coming years.

There are positive signs though. For instance, Current Analysis estimates that IP VPN service revenue will roughly triple between this year and 2004 from $1.6 billion to $4.6 billion.

But broader IP service growth will depend on the underlying technology’s ability to “prove itself” in local access voice, multicasting, video, convergence applications for small to midsize businesses and the replacement of Class 5 switches with

See SuperNet, page 77

Domino faithful want direction from IBM, Lotus

Company says Domino and other technologies will be divided into components.

BY JOHN FONTANA

ORLANDO — Expecting little in the way of major announcements, customers want IBM to use this week’s annual Lotusphere conference to paint a clear picture of where the company’s Domino messaging and application platform fits into future product plans.

“I want to hear them renew the commitment to the Domino brand, and I want to hear how Domino and WebSphere [IBM’s Web/application server] are distinct and how they are complementary,” says Scott Wenzel, a Notes administrator for a federal agency and the creator of several unofficial Lotus Web sites. “IBM has to refine the focus and show how people can stay in the Domino product suite and still move to electronic commerce in the future, or those people will begin to consider other products.”

Lotus officials say Domino will fit into IBM’s component-oriented software strategy, which will involve slicing Domino, Sametime, QuickPlace and e-learning software into pieces that can work with other enterprise applications.

Lotus and IBM have seemingly been driving toward that goal for the past two years, but the effort has been scattered. Last year, IBM introduced its Dynamic E-Business strategy, which aims to tie Domino, WebSphere, Tivoli and the DB2 database into a suite supporting Web services — reusable software components based on XML.

“In the next big leap we move to being a component layer on a [Java 2 Platform Enterprise Edition] infrastructure,” says Scott Cooper, vice president of Lotus Software. “We are introducing a different way to consume our technology.”

Cooper says the vision is “contextual collaboration,” where subsets of Lotus technology become application plug-ins.

“Hopefully they will clearly articulate the message of contextual collaboration where components of Domino can be embedded in business process applications that run through WebSphere,” says Matt Cain, an analyst for Meta Group.

Customers need to know when the infrastructure will be complete, if applications will break or be backward compatible, and whether it will deteriorate Domino’s messaging features, he adds.

Cooper says there are “miles to go for fully integrated collaboration” and that some older Notes applications will have to be modified to work under the new component model. Also, the company has yet to devise a packaging and pricing model.

But Cooper says Lotus will use IBM as an example at Lotusphere to demonstrate how Domino, Sametime and QuickPlace components can plug into e-business applications and reduce computing costs.

The next big push to integrate Domino and WebSphere by adding major support for XML and Java technologies, such as Java Server Pages, will be in the next release of Domino, due later this year. That release will be called Lotus Notes Domino 6, and a fifth beta-test version will be available at the end of next month.

But with Domino 6 having been in development for three years, few surprises exist as to what the platform will deliver (see related story at www.nwfusion.com, DocFinder: 7860).

What is missing is the long-term roadmap.

“They have to show us how to put it all together and not just tell us to buy more [servers],” Wenzel says.■

Lotus agenda

While Lotus’ big message at this week’s Lotusphere conference will be about component software, it also plans a few other announcements:

- Lotus Notes Domino 6 will become the official name of the next release of Domino, which has been code-named RNext. Beta 5 will be released in 30 days.
- Lotus Support will be pulled under IBM Global Services on Feb. 1 as part of IBM’s restructuring of licensing and support contracts.
- The Sametime instant messaging server will be offered in a hosted version through IBM Global Services or other application service providers.

Partners to pitch in

Here’s a sampling of announcements planned by some of the more than 70 partners that will display their wares at Lotusphere:

- DYS Analytics will unveil Email Control 4.0 for Lotus Notes and Domino, a replication and traffic-management tool.
- Albert will introduce AMI Enterprise Discovery for Lotus Domino, a sophisticated search engine that replaces native Domino search technology.
- Sybari Software will show the beta-test version of its Antigen for Domino antivirus tool for AIX.
- Symantec will unveil AntiVirus/Filtering for Domino 3.0, which includes virus outbreak detection, and filtering for malicious attachments or untrusted domains.

It would have been a great day in Detroit...

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09. ☐ Utilities/Process Industries (Mining/Construction/ Petroleum Refining/ Agriculture/Forestry)
10. ☐ Government/Military
11. ☐ Consulting (Independent) *
12. ☐ Education
13. ☐ Carriers/Voice/Data/ISP
14. ☐ Web Hosting/HSP
15. ☐ ASP/SSP/MSP
16. ☐ Manufacturing (Computer/ Communications/OEM)
17. ☐ Resellers/VARs/VADs/ Integrators/Distributors* (Computers/Communications)
18. ☐ Other (please specify) ____________________

*Attn Consultants, Integrators, Distributors, Resellers: Please complete form based on ALL clients and your own business needs

2. P: What is your primary job function? (check ONE only) S: What additional job functions are you involved in? (check ALL that apply)

P S

☐ 1. ☐ Network Management
☐ 2. ☐ CIO/CTO/IS/IT/MIS/ Systems Management
☐ 3. ☐ LAN Management
☐ 4. ☐ Datacom/Telecom Management
☐ 5. ☐ Internet/Intranet/Web/ E-Commerce Management
☐ 6. ☐ Engineering Management
☐ 7. ☐ Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.)
☐ 8. ☐ Consultant (Independent)
☐ 9. ☐ Other (please specify) ____________________

3. What is the estimated value of network equipment and services that you specify, recommend, or approve the purchase of?

(Please print the appropriate number code on the line next to each product category. Please complete ALL categories A–O.)

1. $100 Million or more
2. $50 Million to $99.9 Million
3. $25 Million to $49.9 Million
4. $10 Million to $24.9 Million
5. $1 Million to $9.9 Million
6. $100,000 to $999,999
7. $50,000 to $99,999
8. Under $50,000
9. None of the above

A ____ Large Systems *(Mainframes/Minis)*
B ____ Desktops *(Micros/Laptops/ Workstations)*
C ____ Mobile *(including PDAs, Wireless)*
D ____ Servers
E ____ LANs
F ____ WAN Equipment
G ____ Carrier Services
H ____ Internet/Web/E-commerce
I ____ Intranet/Extranet
J ____ Internetworking *(including Routers, Switches)*
K ____ Storage
L ____ Remote Access
M ____ Peripherals
N ____ Software
O ____ Service/Support Services

4. What is the total number of sites for which you have purchase influence?

(check ONE only)

1. ☐ 100+ 2. ☐ 50 to 99 3. ☐ 20 to 49 4. ☐ 10 to 19 5. ☐ 2 to 9 6. ☐ 1 7. ☐ None

8. Please indicate the Web/Security/LAN/Internetworking/Wireless/Mobile/WAN Equipment/ Carrier Services that you are currently involved in purchasing or plan to purchase:

(check ALL that apply) A. Currently involved in purchasing B. Plan to purchase

WEB

A B

☐ 01. ☐ Web Servers/Software
☐ 02. ☐ Web Traffic Management
☐ 03. ☐ Electronic Commerce Tools
☐ 04. ☐ Web Development Tools
☐ 05. ☐ Web Content Management
☐ 06. ☐ Web Collaboration/ Groupware
☐ 07. ☐ Web Acceleration/Caching/ Load Balancing
☐ 08. ☐ Web Hosting Services
☐ 09. ☐ Other

SECURITY

A B

☐ 10. ☐ Firewalls
☐ 11. ☐ Anti-Virus Software
☐ 12. ☐ Private Key Encryption Tools
☐ 13. ☐ DES Encryption Tools
☐ 14. ☐ Authentication Tools
☐ 15. ☐ Intrusion Detection
☐ 16. ☐ Certificate Authorities
☐ 17. ☐ Biometrics
☐ 18. ☐ Other

LANs/INTERNETWORKING

d A B

☐ 19. ☐ Fast Ethernet
☐ 20. ☐ Gigabit Ethernet
☐ 21. ☐ Layer 3-7 Switches
☐ 22. ☐ ATM Switches
☐ 23. ☐ Routers
☐ 24. ☐ Network Attached Storage (NAS)
☐ 25. ☐ Storage Area Networks (SANs)
☐ 26. ☐ Storage Backup (Optical, Disk, Tape, RAID)
☐ 27. ☐ Network Test/Diagnostic Tools
☐ 28. ☐ Uninterruptable Power Supplies (UPS)
☐ 29. ☐ Network Interface Cards (NICs, PCMCIA)
☐ 30. ☐ Hubs/Intelligent Hubs/ Stackable Hubs
☐ 31. ☐ Cables,Connectors, Baluns
☐ 32. ☐ Wiring/Fiber Systems
☐ 33. ☐ Net Management Systems
☐ 34. ☐ Voice Over IP (VoIP) Tools
☐ 35. ☐ Network Analyzers
☐ 36. ☐ Other Local-Area Network/ Internetworking

WIRELESS/MOBILE

A B

☐ 37. ☐ Wireless LANS
☐ 38. ☐ Wireless/Cell Phones
☐ 39. ☐ Wireless LAN Extension Tools
☐ 40. ☐ Mobile Data Equipment/Services
☐ 41. ☐ PDAs
☐ 42. ☐ Other Remote/Wireless

WAN EQUIPMENT

A B

☐ 43. ☐ Frame Relay Equipment
☐ 44. ☐ Bandwidth Managers
☐ 45. ☐ Bandwidth Shaping/QOS Tools
☐ 46. ☐ VPN Equipment
☐ 47. ☐ ATM Switches
☐ 48. ☐ Voice/Video over IP Gateways
☐ 49. ☐ Modems
☐ 50. ☐ Cable Modems
☐ 51. ☐ xDSL Products
☐ 52. ☐ Diagnostic/Test Equipment
☐ 53. ☐ DSUs/CSUs
☐ 54. ☐ PBXs
☐ 55. ☐ Call Center Tools
☐ 56. ☐ Videoconferencing Gear
☐ 57. ☐ ISDN Equipment/Services
☐ 58. ☐ Other WAN Equipment/Services

CARRIER SERVICES

A B

☐ 59. ☐ Internet Access
☐ 60. ☐ Private Lines
☐ 61. ☐ Frame Relay Services
☐ 62. ☐ ADSL/DSL
☐ 63. ☐ T-1/T-3 Services
☐ 64. ☐ ATM Services
☐ 65. ☐ Managed Services
☐ 66. ☐ VPN Services
☐ 67. ☐ LAN-Extension Services
☐ 68. ☐ OC-3/OC-12
☐ 69. ☐ Wavelength Services
☐ 70. ☐ Dark Fiber
☐ 71. ☐ Other Carrier Services

None of the above (1 – 71) A ☐ 72. B ☐

9. Please indicate the Systems/Peripherals/Software/Applications/Business Services that you are currently involved in purchasing or plan to purchase:

(check ALL that apply) A. Currently involved in purchasing B. Plan to purchase

SYSTEMS/PERIPHERALS

A B

☐ 01. ☐ Laptops/Notebooks
☐ 02. ☐ Desktops
☐ 03. ☐ Intel-Based Servers
☐ 04. ☐ Risc-Based Servers
☐ 05. ☐ Print Servers
☐ 06. ☐ Fax Servers
☐ 07. ☐ Remote Access Servers
☐ 08. ☐ Video Servers
☐ 09. ☐ Mid-Range Systems (including workstations)
☐ 10. ☐ Mainframes
☐ 11. ☐ Printers
☐ 12. ☐ Enclosures/Racks/Furniture
☐ 13. ☐ Other Computers/ Peripherals

SOFTWARE/APPLICATIONS

A B

☐ 14. ☐ Desktop/Server Operating Systems
☐ 15. ☐ Network Management
☐ 16. ☐ Systems Management
☐ 17. ☐ Directory Services
☐ 18. ☐ E-Mail
☐ 19. ☐ Groupware
☐ 20. ☐ Database Management Systems
☐ 21. ☐ Customer Resource Management (CRM)
☐ 22. ☐ Enterprise Resource Planning (ERP)
☐ 23. ☐ XML Tools
☐ 24. ☐ Desktop Videoconferencing
☐ 25. ☐ Middleware
☐ 26. ☐ Document Management Tools
☐ 27. ☐ Site Metering Tools
☐ 28. ☐ Software Distribution Tools
☐ 29. ☐ Data Warehousing
☐ 30. ☐ Applications Development Tools
☐ 31. ☐ Other Software/Applications

BUSINESS SERVICES

A B

☐ 32. ☐ Application Service Provider Services
☐ 33. ☐ Systems Integration/ Consulting
☐ 34. ☐ Education/Training Services
☐ 35. ☐ Other Services

None of the above (1 – 35) A ☐ 36. B ☐

10. Please indicate the platforms that are currently installed/planned:

(check ALL that apply) A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS

A B

☐ 01. ☐ TCP/IP v4
☐ 02. ☐ TCP/IP v6
☐ 03. ☐ SNA/APPC/APPN/LU6.2
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ NETBIOS/NETBUEI
☐ 06. ☐ NFS
☐ 07. ☐ Other Network Protocols

LAN/WAN ENVIRONMENT

A B

☐ 08. ☐ Gigabit Ethernet
☐ 09. ☐ Switched Ethernet
☐ 10. ☐ Fast Ethernet
☐ 11. ☐ Ethernet
☐ 12. ☐ ATM
☐ 13. ☐ Token Ring/Token Ring Switching
☐ 14. ☐ Layer 3-7 Switching
☐ 15. ☐ FDDI
☐ 16. ☐ Fibre Channel
☐ 17. ☐ Wireless LANs
☐ 18. ☐ DSL
☐ 19. ☐ ISDN
☐ 20. ☐ Frame Relay
☐ 21. ☐ Private Line T1, T3, OC-3, OC-12
☐ 22. ☐ Other LAN/WAN Environment

DESKTOP/SERVER OPERATING SYSTEMS

A B

☐ 23. ☐ Windows 2000
☐ 24. ☐ Windows 95/98
☐ 25. ☐ Windows NT/Windows 2000
☐ 26. ☐ Novell (NetWare 5.X, 4.X, 3.X, 2.X)
☐ 27. ☐ LINUX
☐ 28. ☐ Intel based UNIX
☐ 29. ☐ RISC based UNIX (incl. SOLARIS)
☐ 30. ☐ IBM MVS/VM/VSE/ESA
☐ 31. ☐ OS/400
☐ 32. ☐ Digital VMS
☐ 33. ☐ Macintosh
☐ 34. ☐ Palm OS
☐ 35. ☐ Windows CE
☐ 36. ☐ Other Network Operating System

None of the above (1–36) A ☐ 37. B ☐

Continued on next page...

Continued from page one...

5. What is the total number of Servers/Clients installed/planned at your location/in your entire organization? (check ONE box in each column)

SERVERS At Location A		SERVERS Entire Org. B	CLIENTS At Location C		CLIENTS Entire Org. D
☐	1. 50,000+	☐	☐	1. 50,000+	☐
☐	2. 10,000 to 49,999	☐	☐	2. 10,000 to 49,999	☐
☐	3. 1,000 to 9,999	☐	☐	3. 1,000 to 9,999	☐
☐	4. 100 to 999	☐	☐	4. 100 to 999	☐
☐	5. 50 to 99	☐	☐	5. 50 to 99	☐
☐	6. 10 to 49	☐	☐	6. 10 to 49	☐
☐	7. 1 to 9	☐	☐	7. 1 to 9	☐
☐	8. none	☐	☐	8. none	☐

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only)

CORPORATE/ENTERPRISE:
1.☐ Entire Enterprise/ Multiple Enterprises
2.☐ Multinational Enterprise
3.☐ Division/Multiple Divisions

4.☐ Department
5.☐ None

B. Involvement (check ALL that apply)

1.☐ Create Network/IT Strategy
2.☐ Recommend/Specify Brand
3.☐ Approve Purchase
4.☐ Evaluate Products/Services
5.☐ Determine the Need
6.☐ None

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7. What is the estimated number of employees in your entire organization/at your location? (check ONE in each section)

A. Entire organization:

1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 499 or less

B. At your location:

1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 250 – 499
8. ☐ 100 – 249
9. ☐ 99 or less

11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Servers

1. ☐ IBM (Mainframes)
2. ☐ IBM RS/6000
3. ☐ IBM AS/400
4. ☐ Compaq/Digital/ Tandem
5. ☐ Unisys
6. ☐ H-P
7. ☐ Other

B - Workstations/Desktops/Laptops

1. ☐ Sun Microsystems
2. ☐ H-P
3. ☐ Compaq/Digital
4. ☐ IBM
5. ☐ Dell
6. ☐ Gateway
7. ☐ Fujitsu
8. ☐ Other

12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

1. ☐ $20 Billion or More
2. ☐ $10 Billion to $19.9 Billion
3. ☐ $1 Billion to $9.9 Billion
4. ☐ $500 Million to $999.9 Million
5. ☐ $100 Million to $499.9 Million
6. ☐ $50 Million to $99.9 Million
7. ☐ $10 Million to $49.9 Million
8. ☐ $5 Million to $9.9 Million
9. ☐ $4.9 Million or Less
10. ☐ None of the above

13. For which areas outside of the U.S.A. do you have purchase influence? (check ALL that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ Africa
7. ☐ Canada
8. ☐ None

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Infrastructure

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- VPNS ■ NETWORKED STORAGE

Short Takes

■ Cable modems could have three times as much upstream capacity by year-end, enabling videoconferencing and peer-to-peer applications over cable connections. **Cable Television Laboratories,** a consortium of cable operators from North and South America, has completed the specification for **Data Over Cable Service Interface Specification 2.0.** The specification boosts the capacity of the upstream side of the connection, compared with the previous version, to 30M bit/sec in both directions. In the past, capacities varied depending on the quality of the fiber. Interoperability testing of products is due to start in the first quarter of this year, and certification testing is expected by the third quarter, the consortium says.

■ **Symbol Technologies** has unveiled a family of wireless LAN access point devices designed to smooth the transition from older 802.11 networks that use the 2.4-GHz band to the emerging 802.11a networks that use the 5.2-GHz band. The new **Mobius 5224 Access Point** is rigged with a 54M bit/sec 802.11a interface card. But it's also designed to snap onto an installed Symbol Spectrum24 11M bit/sec 802.11b access point (or the older 1M to 2M bit/sec frequency hopping product). Symbol says the 5224 uses the same installed Ethernet cabling and power source as the 802.11b device, while adding a new, shared antenna. The result is that no changes have to be made to the existing 802.11b infrastructure, which continues to support existing applications.

The Mobius 5224 is in beta test and will ship by June. Pricing hasn't been finalized but will be comparable to the cost of Symbol's corresponding stand-alone products: about $900 for the 802.11a access point, and about $800 more if it's ordered from the factory mated with an 802.11b access point. www.symbol.com

Expand to deliver cache devices

■ BY APRIL JACOBS

ROSELAND, N.J. — Cache maker Expand Networks plans to debut a cache appliance this week aimed at making disaster recovery more affordable by reducing the amount of bandwidth it takes to keep backup systems running.

The company will release Accelerator 1800, a low-end version of its Accelerator family, which includes the models 2750 and 4000 caches.

In addition to disaster recovery, Expand's caches are designed to deal with enterprise application data generated from large enterprise resource applications such as Oracle and Citrix's MetaFrame thin client/server software, the company says.

Web acceleration vendors such as Expand, F5 Networks, CacheFlow and Volera have started to target enterprise applications because the service provider market has been in decline, and because those users can benefit from the bandwidth savings and performance improvements the gear offers.

Expand's cache appliance is designed to store frequently accessed or redundant application data that takes up lots of bandwidth over WANs or LANs, such as e-mail headers and application data. The Accelerator 1800 serves information locally to users instead of having it travel across the network repeatedly. The caches typically sit in front of local application servers.

PROFILE: EXPAND NETWORKS

Location: Roseland, N.J.

Founded: January 1998

Primary products: Accelerator Series

Management: Talmon Marco, president; Zohar Pearl, CEO; Ilan Rachmani, CTO

Funding: $30 million from AOL Time Warner, Comcast Interactive Capital, Weiss Peck & Greer, Dain Rauscher Wessels, Tamir Fishman, Emicom Group, Eurocom Holdings and Federated Kaufman Fund.

Fun fact: Last year 10% of Expand's employees earned about 3 million air miles traveling to more than 40 countries.

Pedro Calaco, vice president of marketing for Expand, says one of the biggest challenges companies face when trying to maintain a disaster-recovery system is the cost of a dedicated high-speed recovery network.

According to Gartner, up to 60% of companies do not have adequate disaster-recovery plans and systems — and a major obstacle is cost.

At Fairmont Supply, an industrial supply company in Canonsburg, Pa., Accelerator caches provided enough bandwidth savings to let the company move from a mainframe back office to a thin client Citrix-based environment without purchasing additional leased lines.

By using the Expand caches, Fairmont can cache the MetaFrame data and compress it, reducing the bandwidth requirements by 300% to 400%, says Roger Rush, a technical consultant for Fairmont and president of service provider Network Source One.

Expand competes with cache makers such as CacheFlow, Volera, Network Appliance and Stratacache. Expand's 1800 caches will be available this month, costing about $2,000. The caches have a dual-standard and Fast Ethernet port and support up to 128K bit/sec of traffic for as many as four IP tunnels.

Expand: www.expand.com

Valt·X locks down storage resources

■ BY DENI CONNOR

TORONTO — Storage security vendor Valt·X is looking to protect enterprise data where it lives: directly on your hard drive.

The company last week unveiled the Valt·X Dual Storage Firewall and the RAID Storage Firewall, which sit between a computer's motherboard and hard disk drive to control access to crucial server and workstation operating systems, configuration settings and other system information. The idea behind the storage firewalls is to deflect hacker or virus attacks and keep them from spreading to other networked resources.

The Valt·X Dual Storage Firewall and RAID Storage Firewall work in tandem with mirrored storage arrays, known as RAID-1 level storage components. The combination saves the mirrored RAID settings so they can be automatically relaunched in the event of failure or intrusion to the network.

When a network administrator boots the server, the Valt·X hardware stores the image of the drive and locks the system to prevent any changes from being made. The Valt·X Dual Storage Firewall partitions the server's disk into two partitions: one contains the disk data, and a separate protected area mirrors the system configuration, operating system and applications. The server reads this protected copy when it boots but can not change it without entry of a proper supervisor password.

Ed Kozlowski, president of automotive bearing manufacturer Wheel Weights International in Toronto, bought two Valt·X firewalls after suffering through a messy virus attack. "It caused a lot of lost time and expense getting it corrected that could have been avoided [with Valt·X in place]," Kozlowski says.

The Valt·X RAID Storage Firewall and Dual Storage Firewall compete against adapter- and software-level products such as Jungsoft's HDD Sheriff or Juzt-Reboot Technology's Juzt-Reboot but differs in their implementation. HDD Sheriff and Juzt-Reboot load software on the system, which viruses or malicious code easily could wipe out.

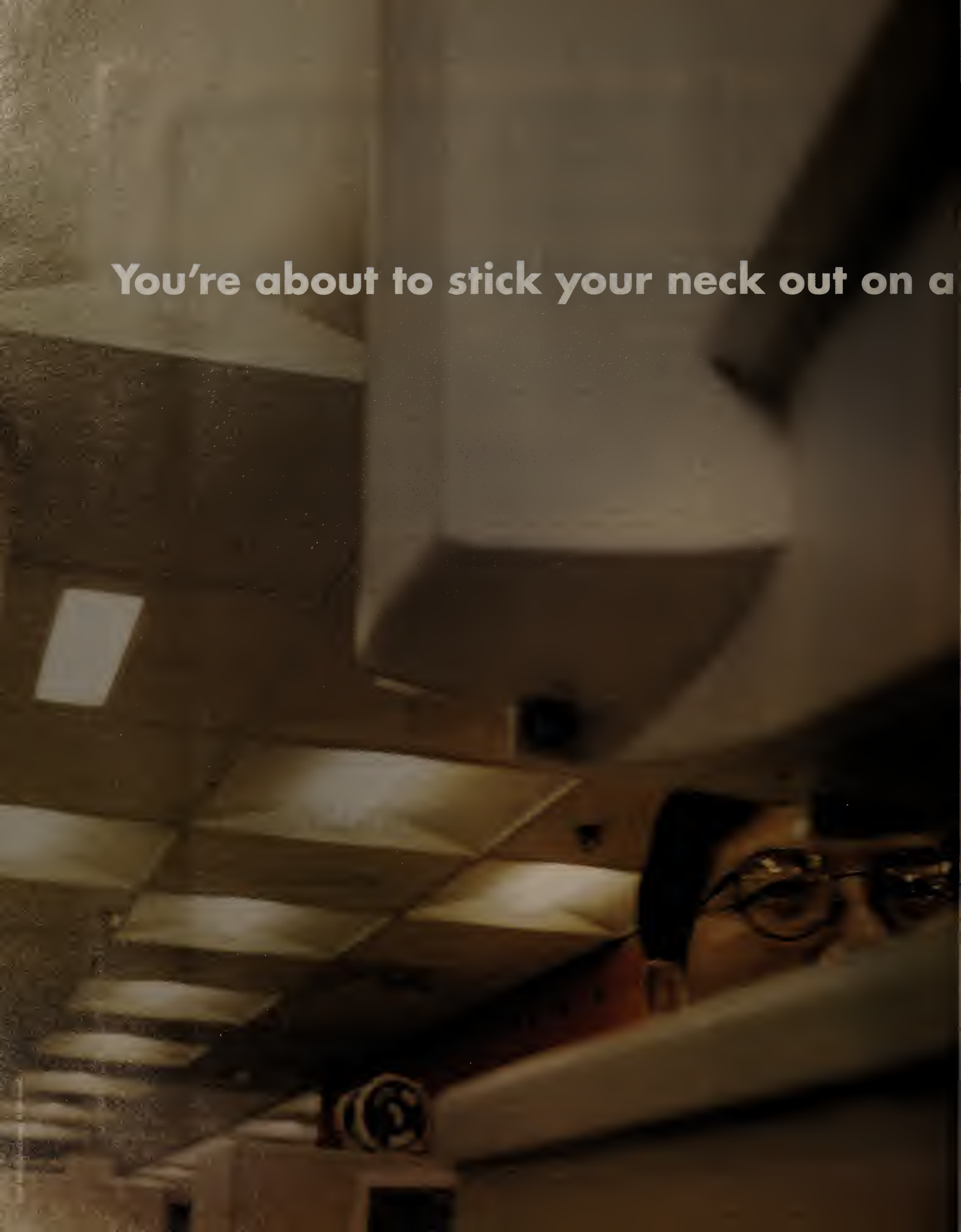
Valt·X Dual and RAID Storage Firewall operate on X86-based servers using Linux, Unix, Windows NT/2000 or NetWare NOS software. The Valt·X Dual Storage Firewall is $125 per server and will be available in March; the Valt·X RAID Storage Firewall is $160 per server and will be available next month.

Valt·X: www.valtx.com

More online!

Download spec sheets, product evaluations and whitepapers from Valt·X, Jungsoft and Juzt-Reboot.

DocFinder: 7833


You're about to stick your neck out on a

server decision that will finally update your data center. The problem is, it's hard enough predicting what will happen next quarter, let alone next year. So how can you be confident that the infrastructure choices you make today are choices you can live with tomorrow?

One option now has to include the new HP server rp8400—a rack-optimized breakthrough designed specifically to help you manage the enormous infrastructure demands generated by today's constantly evolving business environment.

It's small enough to fit two to a rack yet provides unprecedented power and flexibility in a mid-range server. In fact, we've made room for up to 16 processors, setting new standards in the category for both performance density and scalability. The kind of power you need to more easily manage and control workload allocation.

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WIRED WINDOWS

Dave Kearns

No lip service on security this time, Bill

So Bill Gates has been bitten by the security bug and sent a memo to all his employees. That'll certainly make us all feel more secure. After all, wasn't it the famous Gates memo in 1995 that led to the discovery of the Internet? You know, that memo that came out a month after Gates said Microsoft wasn't interested in the Internet.

It is good to know that Bill reads my Network World on Windows Networking newsletter (www.nwfusion.com, DocFinder: 7838) though. The Dec. 31, 2001 issue of the newsletter suggested some New Year's resolutions for Microsoft, the third of which stated in part: "You need to take security more seriously than user-friendliness." This was echoed nicely by Gates' most recent memo: ". . . when we face a choice between adding features and resolving security issues, we need to choose security."

Gates' vision has driven Microsoft for all these years. That vision has been to make the user's experience richer while providing him with all the tools he needs — and then some. Where the vision faltered was in assuming that the user in question was as technically adept as Gates and his buddies.

The emphasis on user experience also caused Microsoft and Windows to lag far behind when it came to networks. It was well into the '90s before the release of Windows for Workgroups signaled Microsoft's discovery of the departmental network, while some say it took the release of Windows 2000 to let Microsoft be considered as an enterprise network company.

Reining in the urge to provide more and more ease-of-use functions (many of which provide the basis for the security exploits launched against Windows) will be very hard for the programmers, engineers and designers in Redmond. For a dozen years, the bonuses and rewards have gone to those who create new and "better" ways to automate the mundane tasks a computer performs. Better, in this context, usually meant "hidden from view."

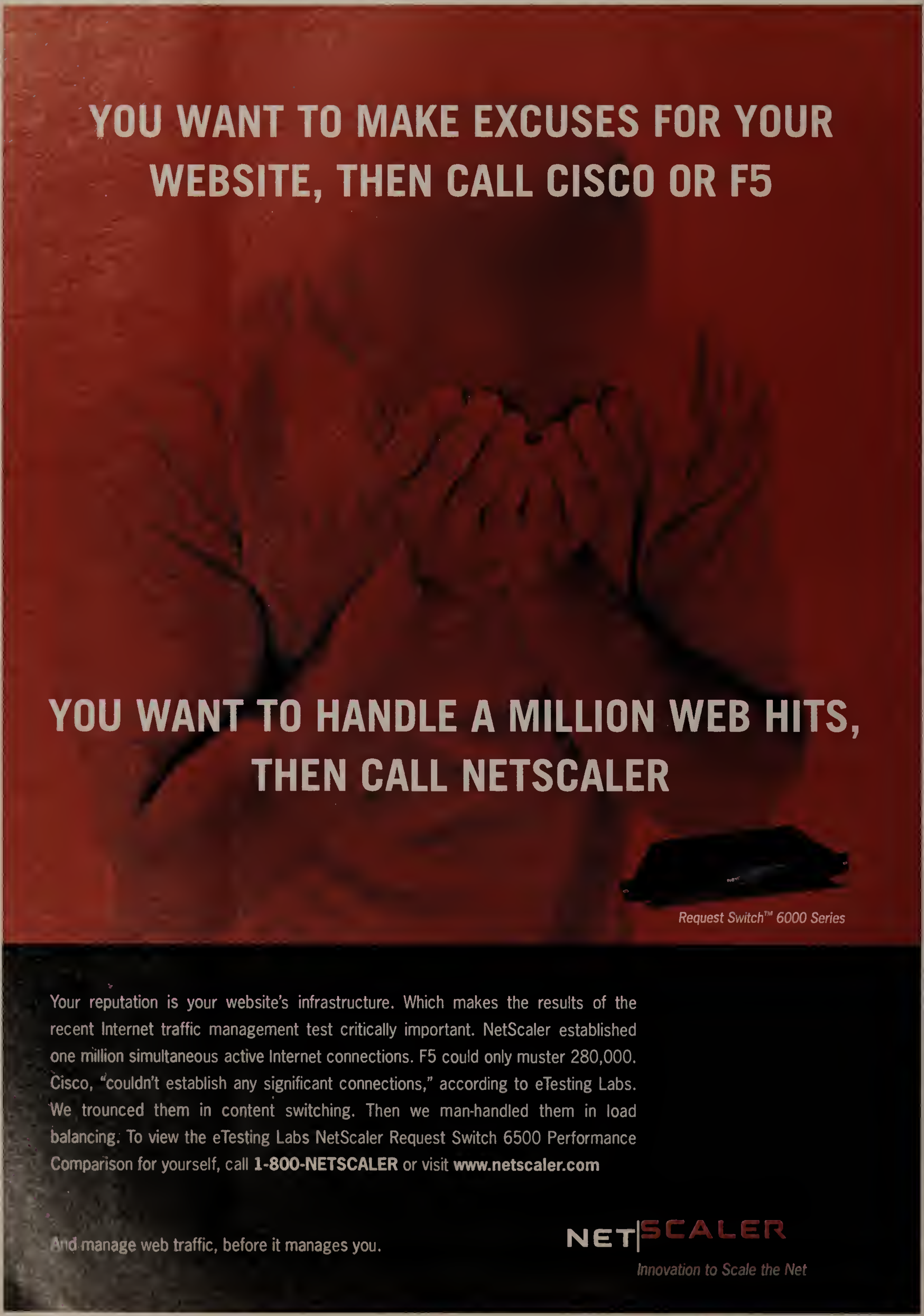
■ **Read columnist Scott Bradner's take on Microsoft's security initiative. Page 32.**

It is going to be difficult, but — like President Bush on Sept. 12 — Gates will have most of his biggest critics lining up behind him to help send the message that security is now the highest priority. But we'll be watching, Bill. If it turns out you're only paying lip service to security, then we'll be back on you like the Marines on Tora Bora.

Kearns, a former network administrator, is a freelance writer and consultant in Silicon Valley. He can be reached at wired@vquill.com.

Tip of the Week

If you're in Washington, D.C., this week, drop in to the **ComNet show** (www.comnetexpo.com) at the convention center, where I'll be talking about .Net, "My Services" and using Directory Services successfully. Let me know what you think about "user-friendliness" vs. "security."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Special Focus

WIRELESS NETWORKS: Gateways may be first step to a wireless infrastructure.

Wireless gateways pave road to enterprise

■ **BY JOHN FONTANA**

Much like the grass-roots introduction of the PC changed network infrastructures forever, the proliferation of mobile computing gadgets in corporations is having a similar effect.

Corporate road warriors who are depending more on mobile devices now desire access to enterprise applications over wireless WAN links.

A recent Gartner study shows that during the next three to five years, corporate users expect to access the Internet through a variety of wireless devices, including modems, phones, PDAs and laptops.

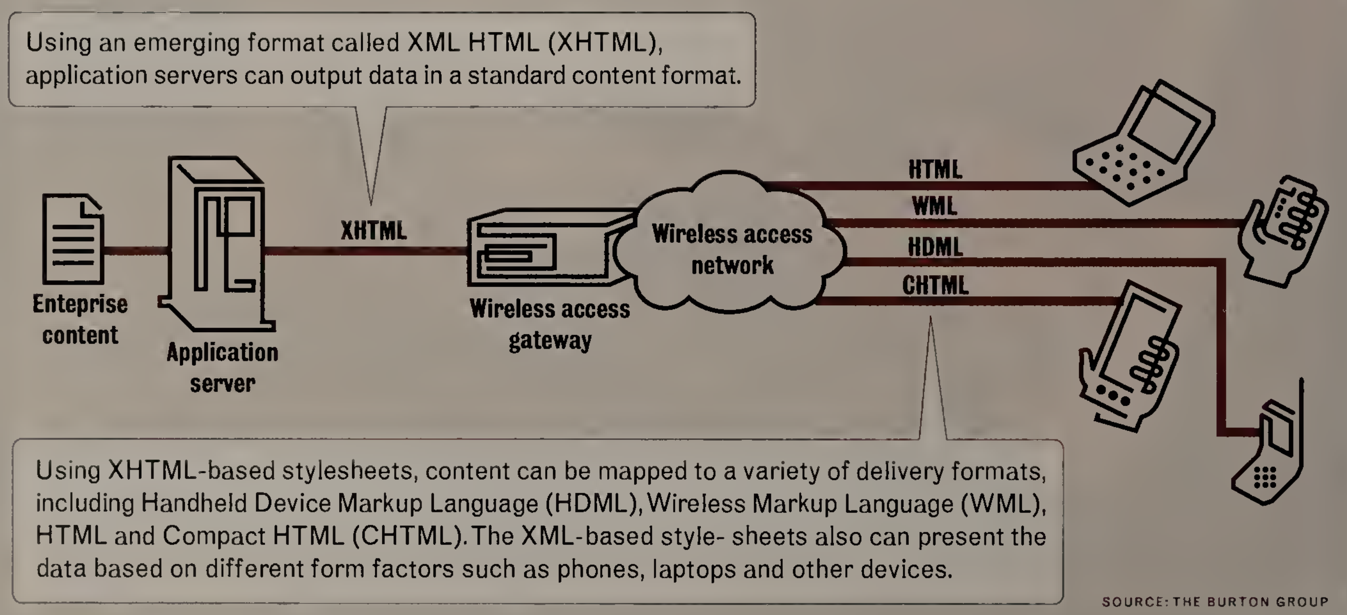
To satisfy that desire, IT executives will have to evolve their network infrastructures with wireless access middleware, or gateways, to help securely and efficiently deliver existing Web and legacy applications and data.

The mobile e-business market, including devices, gateways, carrier services and software, is expected to balloon from $9 billion in 2001 to $25 billion by 2004, according to IDC.

Gateways, which sit between enterprise systems and corporate firewalls, broker connections with wireless devices and provides protocol and content rendering, security and workflow. Gateways also provide queuing services to compensate for wireless latency issues. The evolving gateway contrasts with single-purpose mobile environments built to support access from one wireless device to a single application.

Serving a wireless world

Wireless access gateways can offer a multitude of services, such as content rendering, to serve wireless devices.



Using an emerging format called XML HTML (XHTML), application servers can output data in a standard content format.

Using XHTML-based stylesheets, content can be mapped to a variety of delivery formats, including Handheld Device Markup Language (HDML), Wireless Markup Language (WML), HTML and Compact HTML (CHTML). The XML-based style- sheets also can present the data based on different form factors such as phones, laptops and other devices.

SOURCE: THE BURTON GROUP

"These gateways are kind of like a great big multiplexer between corporate data and the diversity of wireless clients," say Bob Norton, senior manager of Lotus Software's mobile wireless product group.

While gateway technology is still immature, companies such as IBM with its Everyplace Wireless Gateway are developing multifunction gateways that integrate with Web application servers. Others, such as Broadbeam, Cysive, Fenestrae, iAnywhere, iConverse, iPlanet, Microsoft, OpenWave Systems, Oracle and Wireless Knowledge, also offer multifeature wireless gateway products.

In the enterprise

In the enterprise, IT executives are looking to take wireless access gateways out of service providers' hands and bring them within corporate firewalls to maximize control, security and performance of wireless delivered data and applications.

"The trend will be to use the service provider as a bit pipe and put the middleware on the enterprise side behind the firewall," says James Kobielus, an analyst with The Burton Group and author of a recent whitepaper "Mobile Application Architectures."

The gateways are starting to feature more sophisticated operations beyond simple conversion from HTML to Wireless Markup Language (WML) such as content rendering, content security and filtering, messaging routing, virus scanning, workflow, data synchronization and identity and access management.

Kobielus, who also is a *Network World* columnist, says rendering of protocols and content as well as security are key issues for companies.

Today, wireless gateways are used most often for e-mail delivery and synchronization to handhelds with microbrowsers. But the infrastructure becomes more important, especially when 2.5G and 3G wireless technologies begin delivering always-on, high-speed connections.

"The real wireless game is to provide connections to existing intranets and applications," Kobielus says.

Some corporations are already exploring that avenue.

Real-time wireless access

Central Hudson Gas and Electric in Poughkeepsie, N.Y., uses a gateway to add real-time wireless features to a lineup of homegrown mobile data collection applications.

"Now we have the opportunity to communicate what is going on out in the field all day long," says Sue Aber, supervisor of IS development.

Central Hudson uses BroadBeam's Axio wireless access gateway running on Windows 2000 to provide access to its back-end systems. The gateway feeds data to a set of application folders stored on a file server. The file server is used to update the company's mainframe system at various intervals throughout the day. Previously, the update could only be run once a day after data was downloaded from field devices and returned to the office.

"Now our customer service representatives can see up-to-date data when they deal with customers," Aber says. Central Hudson chose Broadbeam for its store-and-forward feature so data could be queued until a wireless device was in a coverage area.

"The gateway was easy to integrate into the infrastructure, and we didn't have to make major changes to the applications to go from the download process to the wireless feed," Aber says. She estimates the infrastructure runs $200 per user. "The greatest costs are still in the [wireless] communications."

In the future, Aber wants gateways to support other applications and securely push those out to various field devices.

Broadbeam and other wireless access gateways are designed to meet that need and more.

Content rendering and security are two important emerging gateway functions.

The gateways can render content for any device after it has been converted fro m a wireline format such as HTML, to wireless formats including Handheld Device Markup Language, WML and Compact HTML. An emerging format called XML HTML is designed so all content can be written in one format for accurate rendering to client devices using XML-based stylesheets.

Fenestrae is one vendor already using XML at a gateway and converting data using stylesheets. It also plans to release this year specialized connectors for enterprise applications, the first being SAP.

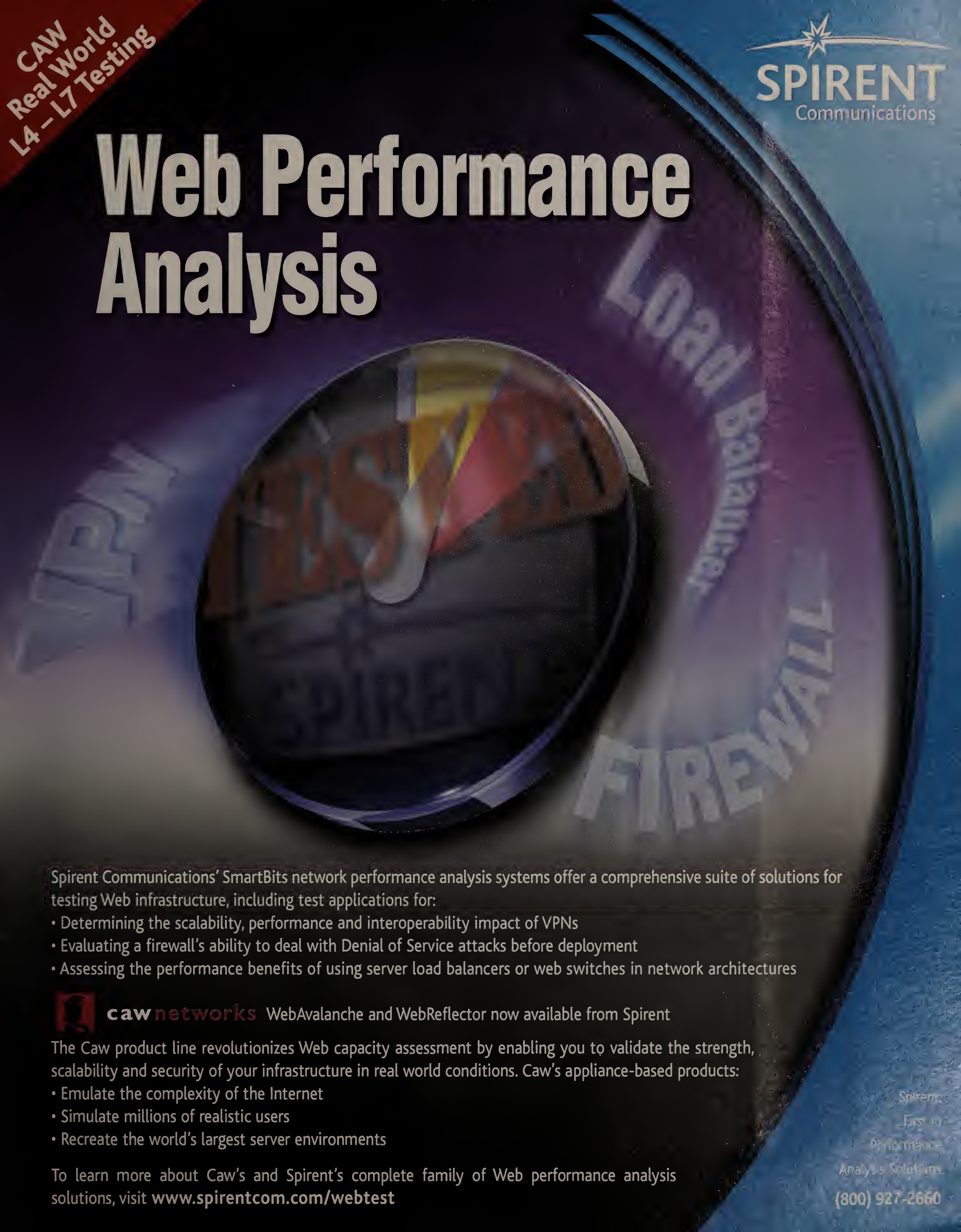
"You only convert the data once to provide access to all sorts of devices," says Vaylor Trucks, product manager for Fenestrae's Mobile Data Server.

Security is another major feature of gateway products, letting companies take encryption and decryption chores behind the firewall. That will be made easier with the Wireless Application Protocol 2.0, which incorporates Transport Layer Security.

While use of gateway products is in its infancy, it will evolve to support sophisticated functions such as personalization, text-to-speech conversion, speech recognition and location-based delivery, Kobielus says. Mobile code management is likely to become another feature with automated, rules-driven software distribution.

The wireless access infrastructure will also require management features and services such as VPNs to enhance security.

"You can put a wireless front end on any application but it will not be extensible and flexible. It will be hard-wired to that application," says George Faigen, Broadbeam's vice president of strategy and marketing. "You want reusable and flexible technology such as a gateway. You want IT people familiar with one architecture that can serve many needs." ■



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Common Sense About Uncommon THREATS

Cisco leads the way with a comprehensive approach to intrusion protection.

Today's competing demands of network openness and security pose a challenge to network managers and enterprise executives alike. While IT professionals have tried deploying best-of-breed solutions, they quickly find that there is no substitute for a comprehensive, pervasive and integrated network security—a layered solution.

Providing both threat identification and mitigation technology, the Cisco Intrusion Detection System (IDS) is just such a solution. Moreover, Cisco IDS is a dynamic security component of Cisco's end-to-end security solution that has been engineered from the ground up to support the broadest range of network deployments, from small businesses to large enterprises.

Cisco's IDS is a critical element of SAFE, the company's best practices security blueprint, designed to launch e-business into the future. SAFE determines which security solutions you should deploy throughout your network via custom-designed modules that simplify network security design, rollout and management. The enterprise gets immediate and clear benefits from SAFE:

- A solid foundation for migrating to secure and cost-effective converged networks
- Cost-efficient deployment of a modular, scalable security framework
- Integrated network protection with the highest-level network security products and services.

The bottom line of SAFE, which provides integrated components, is a quicker, less expensive deployment. This translates into faster time-to-market of your e-business applications and optimal return on investment from those applications.

Within this dynamic SAFE blueprint, IDS provides pervasive intrusion protection. IDS takes a holistic approach to intrusion security, beginning with an understanding of the broad nature of attacks.

Today's enterprises comprise a complex mix of systems and platforms. This situation strongly suggests a comprehensive network security and intrusion protection solution, such as IDS.

The Cisco Catalyst 6500 IDS Module is designed to integrate IDS functionality directly into the Cisco Catalyst 6500 Series Switches.

IDS includes both network and host intrusion detection components, with the host component protecting the servers against attacks on the applications and operating system (see "Stopping Them at the Host"). The Cisco IDS portfolio is a key component of the Cisco Architecture for Voice, Video and Integrated Data (AVVID). The portfolio devices span the network, switch, host, router and firewall infrastructures.

The Cisco IDS also incorporates network-integrated technology, such as the Cisco Catalyst 6500 IDS Module and software-based router and firewall images. With key features and characteristics including dynamic response capabilities, scalability and performance, and security visibility, Cisco's IDS is the industry's first enterprise-scale intrusion detection system.

Specifically, the recently released Cisco IDS 3.0 software for Cisco 4200 Series appliances enables automatic distribution of signatures and rapid updates of attack signatures, as well as provides a robust signature language allowing customers to write their own complex signatures. IDS Network Sensor also features active response support for the Cisco PIX Firewall family and Cisco Catalyst 6500 Series Switches.

Cisco IDS 3.0 answers the key challenge of event monitoring—namely reducing the occurrence of false positives. This effectively shrinks network administration costs because staff can focus on real alarms instead of chasing false ones. Other key features of IDS Network Sensor include:

CISCO SYSTEMS

- Active response, allowing users to configure systems to automatically shun or eliminate specific connections by changing access control lists on Cisco routers, switches and firewalls
- Sophisticated detection of network attacks utilizing complex fragment reassembly algorithms, extensive web de-obfuscation analysis and robust protocol decodes developed by the renowned Cisco Countermeasures Research Team (C-CRT) to combat hacker and insider threats
- Unique protection against distributed denial of service (DDoS) attacks by detecting communications between DDoS agents and the hacker for known DDoS tools
- Comprehensive detection of application attacks covering multiple application protocols.

Another key element of IDS is the Cisco award-winning Catalyst 6500 IDS Module, which reflects Cisco's ongoing effort to migrate network security directly into the infrastructure as an intelligent service rather than as an add-on component.

The Catalyst 6500 IDS Module addresses switched environments by integrating the IDS functionality directly into the switch. This allows users to monitor traffic directly off the switch backplane rather than having to utilize external SPAN ports.

With other sensing platforms and network security appliances, and security management and monitoring options within IDS, Cisco offers the most comprehensive, integrated intrusion solution available. For more information on IDS and the Cisco network security solution set, go to www.cisco.com/go/idssolutionskit.

Stopping Them at the Host

The host provides application services, and thus is highly visible on the network and a common target of attack. It also presents some formidable security challenges, owing to the sheer number of different host platforms, operating systems and applications in the enterprise today.

The Cisco IDS Host Sensor, powered by Entercept™, identifies and blocks attacks before any unauthorized transactions or intrusions can occur. Where other host defense systems merely detect a problem, Host Sensor mitigates potential damage because it is preventive in nature. This results in optimal system availability, which leads to optimal return on investment of the system itself.

"The Cisco IDS Host Sensor is an important extension of Cisco's security monitoring and management portfolio, giving customers comprehensive network and host-based intrusion detection capabilities," says Richard Palmer, VP and general manager of Cisco VPN and Security Service. "It exemplifies Cisco's commitment to provide practical security solutions for e-business."

Host Sensor is installed on each server, guarding both the operating system and the applications it supports, providing protection from threats like Code Red. Employing unique interception techniques, Host Sensor's key features include:

- On-the-spot attack prevention, due to its ability to prevent attacks at the system call level before they execute
- Prevention of buffer overflow attacks by identifying the execution of the injected code and preventing the most commonly exploited vulnerability from compromising the system
- Upgraded integrity resulting from the sensor locking down the system by controlling access to the system binaries, configuration data and other system objects.

Host Sensor complements other elements of the Cisco IDS for the smoothest integration of security components offered by any single security provider. And as a key component of the Cisco SAFE security blueprint, IDS represents the most comprehensive and pervasive answers to enterprise threats. For more information on IDS Host Sensor, go to www.cisco.com/go/idshost.

wireless:

Network connections

An Executive Report Produced
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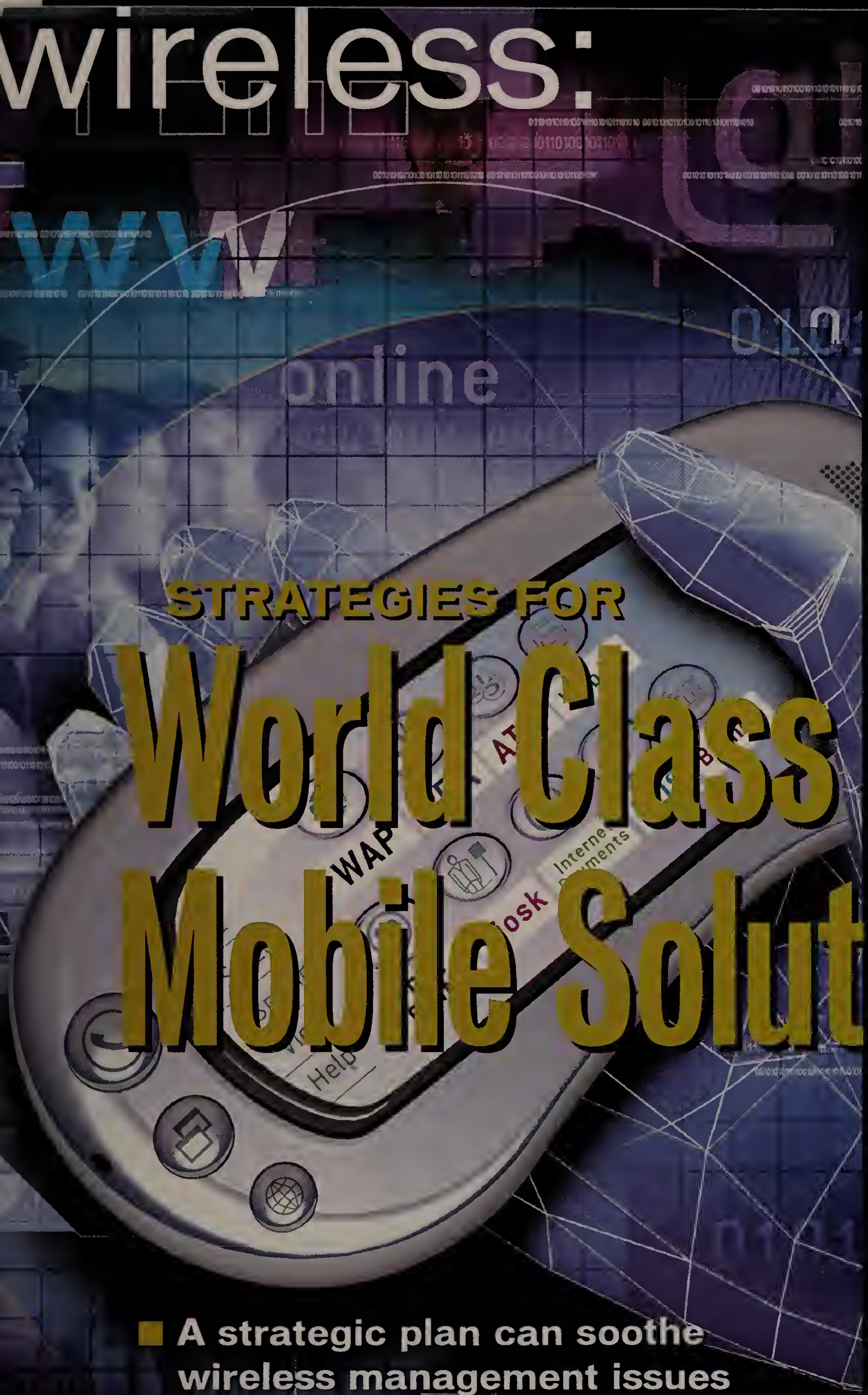

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- American Airlines and FedEx point the way to the future
- Tips for setting device standards

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Herding Cats

In the words of Yogi Berra, it must seem like "déjà vu all over again" to many of you IT managers. Just as PCs flooded the enterprise through every side door and window a generation ago, suddenly millions of wireless devices have spontaneously generated.

These burgeoning wireless devices and those who increasingly depend upon them are now begging for attention from IT. The devices need to be integrated into the enterprise mainstream. They need to communicate more effectively, not only with corporate systems but with each other as well. Their communications and networking need to be safe and secure. This probably has a familiar ring to those of you who helped guide IT organizations through the PC proliferation.

Today's wild and fast-growing popularity of wireless devices is in step with work preferences and styles of mobile professionals. More and more, these people demand real-time access to sensitive data, high-speed network connectivity, and other features that took decades to develop for the office setting. Are you prepared to deliver?

Look inside this supplement to see how quickly American Airlines was able to press a wireless solution into service in response to travel changes resulting from 9/11 (page 16). You can learn about the importance of a comprehensive wireless strategy and how such a strategy can mitigate some of the thornier wireless management issues (page 6). Or you can see the benefits that flow when IT decides to set some standards for wireless devices in the enterprise (page 10).

It's akin to herding cats, but gaining control over the wireless world may be the most important job you do in the coming months.

—Bill Laberis,
Project Manager

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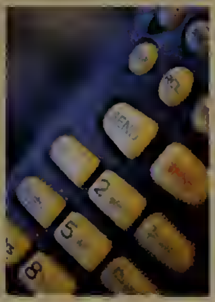

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SOOTHING THE STING OF THORNY Management Issues

Wireless devices create new security and support challenges for network managers. A wireless strategic plan can help. BY DAVID KELLY

EVER THOUGHT THAT your biggest management and security risk would be the backseat of a London cab? If you're a network manager deploying mobile and wireless devices, you might want to consider it.

An estimated 62,000 mobile phones, 2,900 laptops, and 1,300 handheld computers were left behind in London cabs in just the first six months of 2001, according to a recent survey of London taxicab drivers by *Taxi Newspapers* and Pointsec Mobile Technologies of Stockholm, Sweden, and Walnut Creek, Calif. If those standard mobile phones had been integrated phone/PDA/mobile application platforms, corporate espionage would be as easy as popping down to Trafalgar Square in a cab.

“The biggest threat to an enterprise from wireless technologies is not from wireless LAN access points, but from roaming handhelds,” says Jaclyn Easton, author of the upcoming HarperCollins book, *Going Wireless: Transform Your Business with Mobile Technology.* She explains, “You've got an entire workforce roaming around with corporate e-mail, contact logs and phone numbers, access to enterprise applications, and all types of corporate data.”

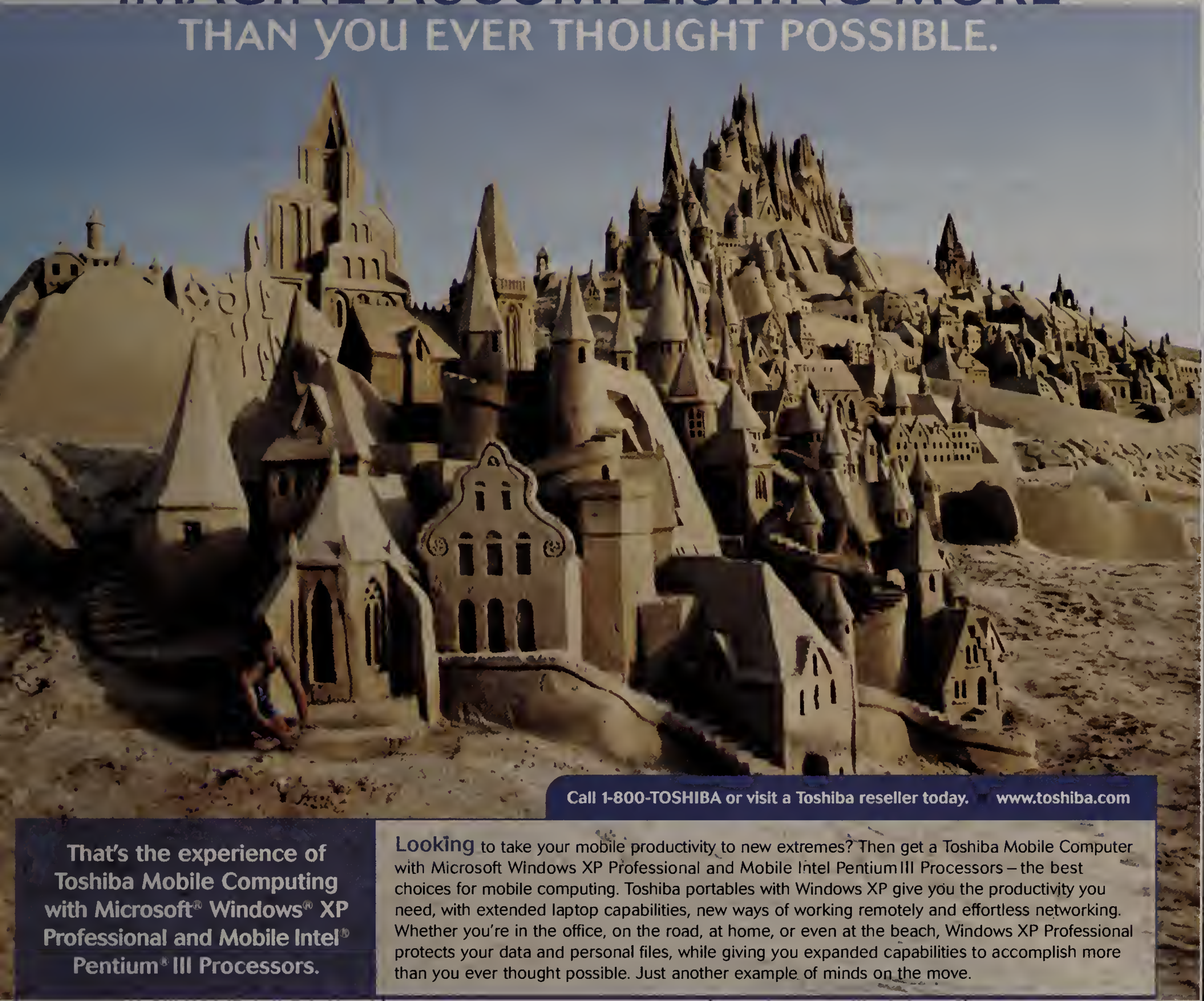
REID HORN

REAL-TIME ACCESS TO DATA CAN LEAD TO UNEXPECTED ISSUES, SAYS FRANCK PARACHINI, VICE PRESIDENT OF TECHNOLOGY AT PEGASUS TRANSAIR, GRAPEVINE, TEXAS

There are ways to secure mobile wireless devices against this scenario through passwords and other means, but the example illustrates how new technologies put a different spin on traditional management challenges.

For example, while wireless provides faster access to corporate data and applications, it also means that you have to secure network boundaries that have expanded to any point on the globe. And the ubiquity of wireless devices creates the challenge of supporting, managing, and securing the myriad changing platforms (as well as possibly reacting to one-off purchases by business executives). Finally, real-time access may put network administrators in the unusual position of helping business executives understand how to use and respond to this new stream of information.

IMAGINE ACCOMPLISHING MORE THAN YOU EVER THOUGHT POSSIBLE.



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> "The biggest threat to an enterprise from wireless technologies is not from wireless LAN access points, but from roaming handhelds."
> Jaclyn Easton, author

Don't know where to start? Start by building a wireless/mobile strategy that's anchored to specific business goals. For example, enabling salespeople to respond more quickly to customer requests is a better goal than providing wireless e-mail to executives who think it's cool.

Then tackle the real management issues by defining your wireless management and security policies. Define areas such as:

- Who owns the mobile devices—your company or the employee?
- What level of passwords or authentication will be required?
- Who updates the remote software and applications?
- When and how are updates done?
- What standards will be supported?

Plus all of the other lifecycle issues.

"We recommend that companies first formulate a wireless and mobile strategy, then define the wireless policies—who will do what, when, where, and how," says Ken Smiley, senior research analyst at Giga Information Group, Cambridge, Mass. Only then, he says, should they "decide on and purchase the specific technologies to fill out the strategy."

Trying to manage a whole workforce of "Mr. Magoo"-like salespeople or executives who are constantly forgetting mobile devices in cabs, hotels, or other places? It may not be as difficult as you think to secure them and still provide a useable application.

Account for such scenarios in your wireless/mobile policy—decide how quickly access numbers and passwords are changed, or when services are cancelled. Define what authentication is required on the device: Will simple power-on passwords do, or do you need to deploy stronger authentication such as PKI or secure tokens? How secure do you need the wireless link to be—can it be unencrypted, does it need basic SSL, or should you move to some type of virtual private network (VPN) client? And remember to consider any special industry or regulatory requirements, which might dictate additional security precautions.

Keep in mind that there is, and will continue to be, a variety of wireless standards, devices, and networks. Existing enterprise management platforms are quickly adding wireless capabilities and support, but it's almost impossible to have a consistent integration with all the new devices and platforms being released.

According to Smiley, expect to do about 90 percent of your wireless management through definition of good strategies, policies, and one-off management applications or hooks for different wireless devices: "There's simply not a good universal suite for managing multiple devices yet," he says.

While the enterprise management component of wireless devices is still catching up to the changing technology, there are a number of companies offering ways to deliver customized content for different devices, making it much easier to develop applications that can be accessed from different platforms or manufacturers.

MANAGING EXPECTATIONS

Real-time, wireless access to data and applications can have some unexpected consequences. "We had to train managers and customers not to overreact to the information they were seeing on their wireless devices," says Franck Parachini, vice president of technology at Pegasus TransAir, a transportation and logistics management company in Grapevine, Texas. "With real-time data access, the information they receive at 10:15 a.m. may look very different from the information only a few minutes or hours later. They're seeing data they never saw before, since previously they would have only seen it once a day or occasionally."

For example, if you're a shipping company providing your employees and customers access to monthly on-time delivery information, real-time data delivery can wreak havoc with performance statistics. Consider a customer who has two shipments delivered the first day of the month, one on time, and one late. With real-time wireless access to performance statistics, the customer would see a 50 percent on-time record. That figure may be misleading about delivery performance over a longer stretch of time. In most such cases, the statistics at the end of the month will look vastly different from the beginning of the month.

"You really have to be aware of the flow of the information to help your users understand what it means and when it's important. Train your users to ask questions before reacting to information and making quick decisions," says Parachini.

Like any new technology, wireless networking brings new challenges to enterprise IT management. But by putting a wireless strategic plan in place, along with the associated deployment and security policies, network managers can provide innovative solutions that deliver immediate business benefits in a manageable way. ■

David Kelly is a business and technology writer in West Newton, Mass.

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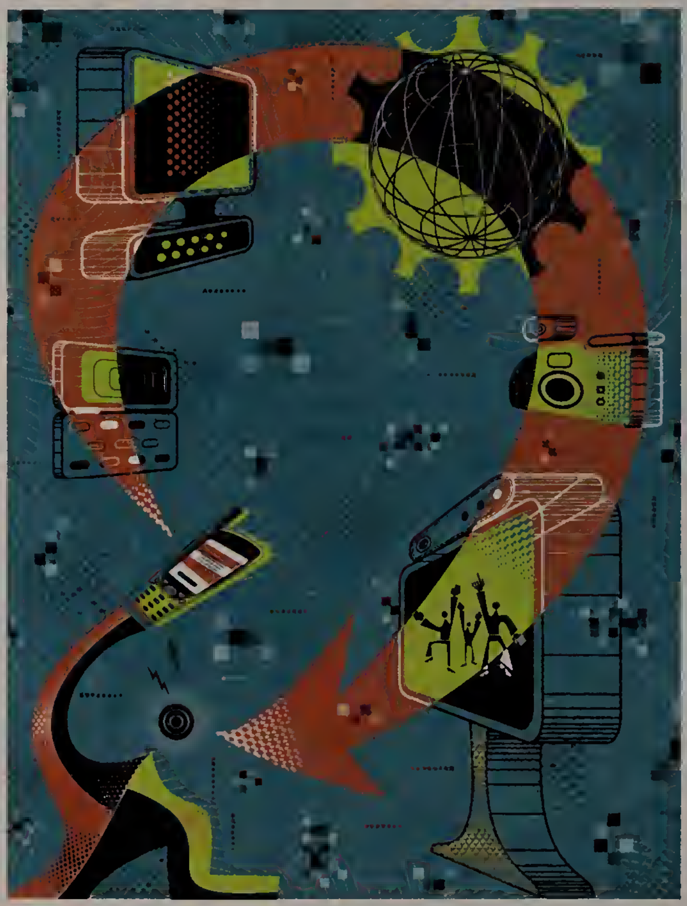
Strategies, tips, and best practices for standardizing on handheld wireless devices. BY PAUL DESMOND



CAMPBELL LAIRD

IN A SURVEY of 50 large companies earlier this year, Forrester Research found about three-quarters of them let employees choose and pay for the handheld wireless device they wanted to use, be it a personal digital assistant or some type of smart phone. Two years from now, however, the same companies expect the situation to be reversed, with 75 percent dictating the type of handheld device employees will use and footing the bill, according to Frank Gillett, a senior analyst with Forrester, based in Cambridge, Mass.

Today, as the Forrester survey indicates, it is nearly impossible to standardize on a single wireless handheld platform. New models are rolled out regularly and no one device or operating system dominates like the Windows platform does in the desktop realm.

TWO-PRONG STRATEGY

Forrester's advice is to attack the problem using a two-prong strategy. First, recognize that there will always be smart phones that are employees' personal property. That means you need to be prepared to help synchronize the personal information managers (PIMs) on these devices with the PIMs on employees' desktops, Gillett says. That will mainly come down to being able to sync address books and calendars, but even that can cause headaches given the myriad types of devices and PIMs in use. Standards are in the works that can help, he notes, such as SyncML, which hundreds of wireless companies support.

The other key prong is choosing the application that you want to support, Gillett says. The idea is essentially to adopt an appliance strategy, where you buy the device that's right for the job at hand, be it stock pickers in a warehouse or truck drivers in the field.

"Identify the business problem and either buy an application and the hardware it runs on, or hire a systems integrator to build the application for you and designate the hardware," he says. "This isn't about choosing a platform on which all of your applications run. The whole point of this gadget, at least for front-line workers, is that it runs the application they need to do their job."

The key to making the strategy pay off is to do a cost/benefit analysis up front, as you would for any business expense. There will be some risk factor to consider in terms of the technology changing rapidly. "But that shouldn't prevent people from jumping on high-payback opportunities if they present themselves," Gillett says.

PUT THE OS FIRST

Michael Sampson, consulting research analyst with San Francisco-based Ferris Research, agrees that the application should drive the handheld selection process. He recommends you first decide what capabilities you need, then create a matrix to organize all the options. Look at which

(Continued on page 14)

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OPTIMIZE

The Value of

Cisco's CTE performs as a universal "decoder ring" between

WHAT IS THE VALUE of business-critical content if users can't access it when they want it and how they want it—that is, with their choice of devices? The answer of course, is: Not much, no matter how good the content is.

This is a conundrum faced by many mobile professionals. They are well armed, with an array of IP phones, palm devices, pocket PCs, wireless phones, and so on. But getting corporate and Internet information to these devices has been difficult at best, not to mention costly and cumbersome.

But all that has changed, and mobile productivity may well jump an order of magnitude as a result.

WIRELESS WONDER

The Cisco CTE 1400 Series Content Transformation Engine (CTE) seamlessly and transparently transforms existing enterprise content for display on virtually any mobile wireless device that has a screen and browsing capabilities. Plugged into the network in front of the content servers, the CTE can transform content uniquely for each device in the field—as well as for the Cisco IP Phone—and send that content over the network to the proper device.

THE SLEEK AND COMPACT CISCO CTE FITS INTO A SINGLE SPACE ON A RACK UNIT.

With the CTE acting as a sort of universal "decoder ring" between the users and the content they need, revenue-enhancing possibilities abound. For example, salespeople will be able to deliver immediate customer gratification by accessing and delivering vital information on product pricing, availability, shipping, and support right on the spot. This kind of fast service can translate into greater customer retention and improved sales closings.

Senior executives who typically spend half or more of their time away from the central office will find that their mobile devices can easily request and then display corporate directories and calendars, real-time financial updates, and general intranet access.

For field service and support staff, the CTE will offer reliable wireless access to case queries, customer updates, and technical information.

"The bottom line for the enterprise is that the CTE can make the company run more efficiently, and improved efficiency is the key to survival today," notes Seth Redmore, product-marketing manager at Cisco Systems. "The CTE's ease of use and simple installation and setup also make for lower total cost of ownership and a higher return on investment. We make it easy for users to display the information they need, and when technology is easy to use, we find, it becomes very popular."

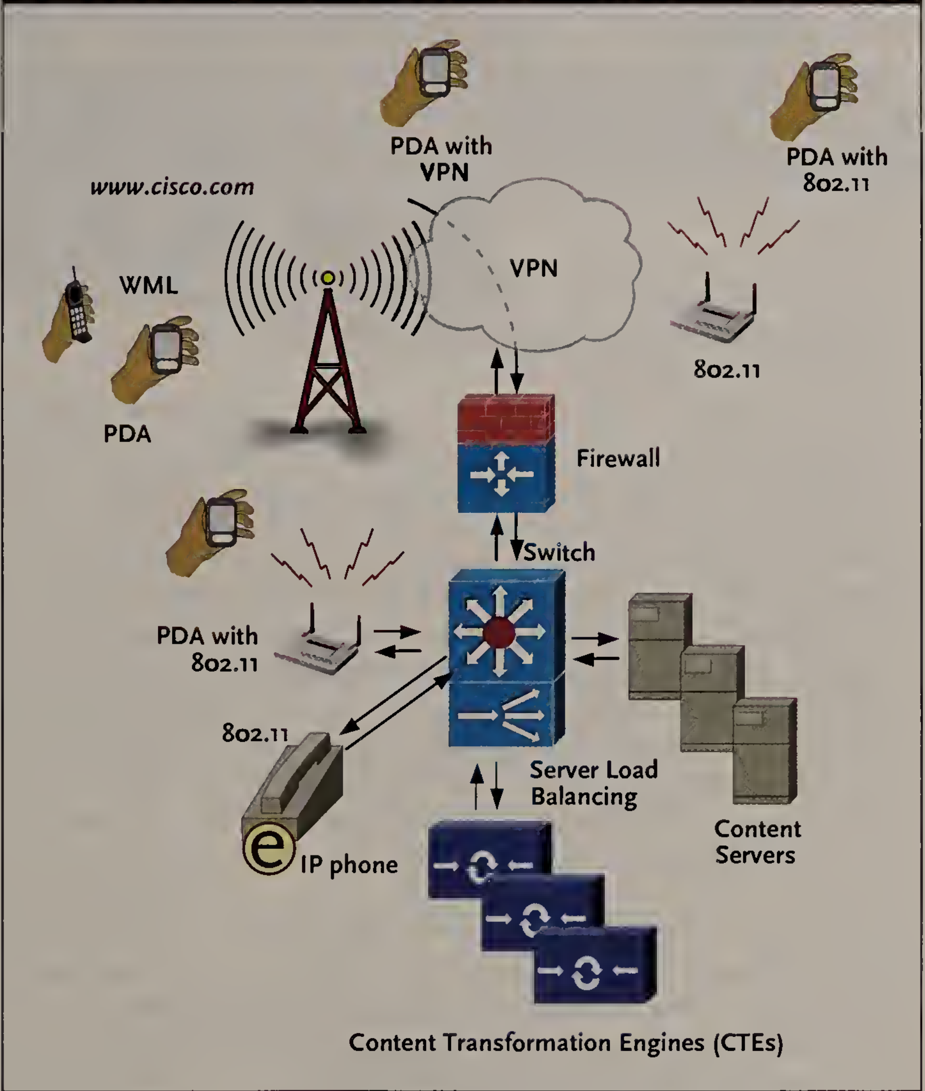
In other words, when an organization provides mobile workers with valuable content on a small screen via a reliable connection, what the organization is really delivering is a competitive advantage.

For the IT professionals who support the mobile workforce, the Cisco CTE is a truly IT-friendly solution. The device slides into a rack unit in a single space and

Content FOR MOBILE USERS

wireless users and the content they need.

Content Transformation Engines (CTEs) in Action



installs literally in minutes. It integrates seamlessly with routers, switches, load balancers, firewalls, and all the other vital parts of an enterprise network.

KEEPING IT SIMPLE

The CTE requires none of the usual and expensive content duplication or maintenance chores. It works with existing content and doesn't require that content to be altered one bit. Following installation, non-programmers will be able to create device-specific data transformation instructions by clipping and editing content using a simple point-and-click interface.

The CTE automatically recognizes the device making a content request, and then dynamically transforms the content to suit that device's memory and screen requirements. There's no need for expensive skilled programmers, nor are there any monthly hosting charges or continuing contracts for customization as content evolves. You can create transformation rules for a large body of content in a matter of a few hours, and then download these rules to multiple CTEs anywhere in the network.

Of course, the security of sensitive corporate data is paramount to IT staff. That's why the CTE provides a Secure Socket Layer (SSL) connection. Each CTE supports 1400 simultaneous connections and 10,000 user sessions. And should the demand for CTE-based services grow beyond these capabilities, you can simply stack additional CTEs and scale up.

Mobile users have been able to surf the Internet for some time. Now they can access meaningful content as well, thanks to the Cisco CTE.

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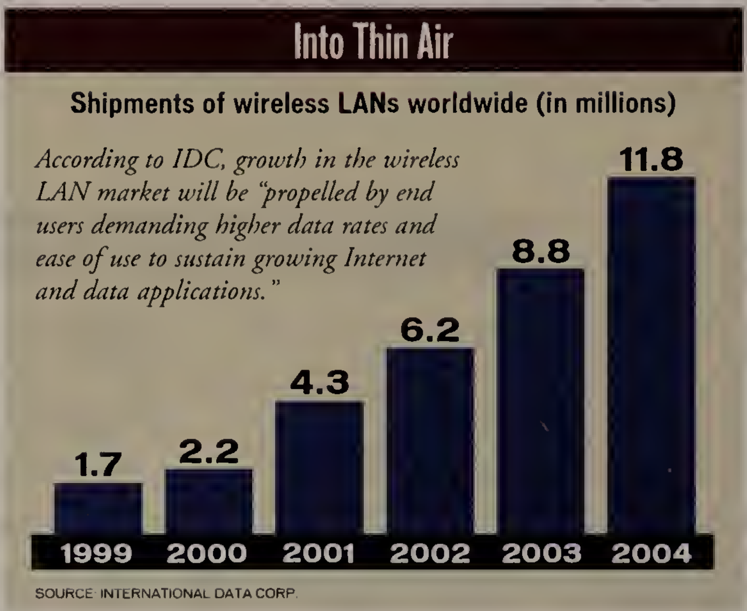
For more information, click on www.cisco.com/go/ctearticle.

(Continued from page 10)

operating systems will support those capabilities, then which services and devices will support them.

"I'd put them in that order because the OS is the more important aspect—that's the part the organization is committing to for the longest time," he says. "Services are second, because carriers will increasingly offer wireless services to specific OS platforms; and the device is third, because they change in form factor and design so frequently."

Sampson also recommends conducting an audit of your user population to find out what they're already using and are familiar with. Also examine the corporate policy on phone and computer hardware purchases. If these buying decisions are made centrally, the same policy should apply for wireless devices, Sampson says. But if purchase authority is delegated to a departmental level, that limits your ability to dictate a specific wireless device.



Into Thin Air

Shipments of wireless LANs worldwide (in millions)

According to IDC, growth in the wireless LAN market will be "propelled by end users demanding higher data rates and ease of use to sustain growing Internet and data applications."

SOURCE: INTERNATIONAL DATA CORP.

Still, if employees will use devices to access enterprise applications, enterprises have to standardize, he says. "Otherwise they'll face escalating support costs and application complexity over time, due to the plethora of disparate devices in use." For example, the help desk staff would have to know the different capabilities of a device running Palm OS 4.1 vs. 3.5 and how to troubleshoot application conflicts with each.

In terms of operating systems, at least, the choices are limited, says Mark Margevicius, research director with Gartner Group in Cleveland. "The market has clearly aligned itself behind the Palm OS and the Pocket PC," he says.

Each has pros and cons. The Palm OS, developed by Palm Inc., Santa Clara, Calif., has good usability and PIM applications, but is based on an older, 16-bit computing architecture. The Microsoft-developed Pocket PC, meanwhile, struggled out of the gate but is based on a 32-bit platform and the Windows architecture, making it familiar to both developers and end users.

Palm OS is the market leader and is likely to be in use in most organizations. So Margevicius says it makes sense to standardize on that for fairly simple, PIM types of applications. "And Pocket PC is good if you're ready to deploy internal vertical applications, like sales force automation, CRM, or some other type of mobile application," he says. That's due mainly to its 32-bit platform, which supports richer, more complex applications.

THE STATE OF STANDARDS

A number of standards efforts are under way to create a common software platform on which applications can run. These include Java 2 Micro Edition (J2ME), Mobile Station Application Execution Environment (MExE), Binary Runtime Environment for Wireless (BREW), Nokia's Open Mobile Architecture, and the GSM Association's M-Services initiative.

"These standards will help address many of the problems that companies face today, but they are only at the beginning of their adoption cycle," Sampson says.

Additionally, some of the standards work only with certain underlying wireless networks. BREW, for example, is intended for Code Division Multiple Access (CDMA) nets. Indeed, the type of network is another consideration with respect to the standardization question.

Unlike in Europe, where most all services are based on the Global System for Mobile (GSM) Communications standard, numerous wireless standards are employed in the United States, including GSM, CDMA, Time Division Multiple Access (TDMA), and Integrated Digital Enhanced Network (iDEN).

"I don't think the type of network matters much unless you're trying to buy technology that allows roaming between continents," Gillett says "The choice boils down to who offers coverage in the area you care about."

That may change as providers roll out 3G, or third-generation, services that promise far higher data rates and "always on" connections. In the interim, carriers are now prepping services based on the General Packet Radio Service (GPRS) protocol, which offers similar service although at slower rates. "That's coming out now. You could be deploying an application next summer with it," Gillett says. ■

Paul Desmond is a writer and editor based in Framingham, Mass. He can be reached at paul_desmond@kingcontent.com.

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DANNY TURNER

American Airlines and FedEx point the way to future wireless applications.

BY LAUREN GIBBONS PAUL

AMERICAN AIRLINES KEEPS CUSTOMERS MOVING WITH WIRELESS APPLICATIONS, SAYS MARY MCKEE, MANAGING DIRECTOR OF AIRPORT AUTOMATION FOR AMR CORP.

When the Federal Aviation Administration briefly halted curbside check-in for airline passengers in the wake of the September 11 terrorism attack, American Airlines tapped several versatile wireless applications to help soothe skittish customers and speed them on their way.

First, American altered its five-year-old One-Stop Curbside wireless application for the new travel conditions. With curbside check-in service suspended, check-in personnel rolled their podium-PC workstations from the sidewalk outside to the counter area inside. There, personnel used more than 300 units at 80 airports nationwide to check in passengers (whether they had paper or e-tickets), printing boarding passes and bag tags from embedded printers.

Travelers with only carry-on bags checked in even faster with the help of American's Roving Agent application. Currently available in 25 U.S. airports, Roving Agents carry Palm OS handheld devices and wear tiny printers on their belts, enabling them to walk around and check in passengers where lines are especially clogged or if someone is about to miss a flight.

Currently, these agents can print only boarding passes, not baggage tags, so those with bags to check must go to the counter or use curbside service, which most airports resumed a few weeks into October.

Both custom-developed wireless applications—based on the 802.11b protocol, the IEEE wireless LAN standard—helped American ease the long lines that were common in the chaotic days after the attacks on America.

"We tried to keep our customers moving as quickly as we could," says Mary McKee, managing director of airport automation for $20 billion AMR Corp. (American's parent) in Fort Worth, Texas. "We figured that was one of the best things we could do in terms of customer service," especially when aggravating delays and jangled nerves seemed destined to become a permanent part of the air travel experience.

"Our management wants our customers to have the same experience regardless of where they are located."
Ken Pasley, FedEx

LOOKING FOR "LINE-BUSTERS"

Many airlines are looking into wireless "line-busting" applications such as the ones used by American, according to Frank Gillett, senior analyst at Forrester Research Inc., Cambridge, Mass. "They can service you while you're standing in line. It makes a lot of sense in terms of customer satisfaction."

American will rely on cutting-edge wireless technology to comply with the new, more stringent federal regulations regarding passenger baggage, too. According to McKee, airlines will soon have the requirement to match each bag loaded onto the plane with a passenger onboard. (American currently manually matches bags with passengers.) Set to roll out in the middle of 2002, a new wireless application will allow baggage handlers to scan passengers' bags once in the outbound bag room, and then again planeside.

In addition to helping comply with the FAA regulations, the application will aid American in improving its baggage handling rates. "Our rates are as good as anyone's in the industry, but this will help us get even better," says McKee. "We'll be able to scan the bags as well as the container to know exactly where all the bags are positioned in the hold. We can also make sure the bag does not get on the plane without its associated passenger."

Before it can launch a beta program of the baggage-tracking application, American is working on expanding its wireless coverage to protect against glitches. "We're testing to make sure the coverage is where it needs to be. These big chunks of metal—aircraft—could interfere with our wireless network, so we're doing a lot of testing," says McKee.

American has not experienced many problems with the interface between its wireless applications and its wired IT network infrastructure, according to McKee. "We have a dedicated network infrastructure team devoted to this." A bigger challenge is the addition of towers and other equipment for data transmission at the airports. Unlike most enterprises that use wireless technology, American must get the approval from the airport authority before it adds or adjusts wireless transmission towers.

Says McKee, "We're putting our access points and antennas in a very public place. So we have to be very aware of how we're affecting the airports. It's not a challenge that most companies have to deal with. But it's not really a problem for us."

GOING PUBLIC

Like many early adopters of wireless technology, American built its proprietary wireless network several years ago. According to McKee, the carrier will stick with this private network for the foreseeable future.

This will not be the case for another high-profile wireless pioneer: the $20 billion overnight package delivery giant Federal Express Corp.

FedEx kicked off its wireless initiative back in 1981 with a hefty $100 million investment in infrastructure and development. Part of that investment went toward building a proprietary wireless network. Over the years (and many dollars later), FedEx slowly replaced all of its wired LANs and WAN, and installed a wholly wireless data network to be used by its mobile couriers as well as office-bound employees. The network has served the company well, giving its 50,000 couriers the ability to transmit package-delivery information from their vans while making deliveries.

But today, FedEx is developing a plan to migrate from its stalwart proprietary wireless network to a solution based on the public network. "The improvements in quality and coverage over the past few years are motivating us to look very seriously at this," says Ken Pasley, director of wireless development for FedEx in Memphis. "Our network has done very well. But it's aging and we have to maintain it. The public networks' coverage is getting to be greater and the costs are coming down." Security won't be a major concern because of the widespread availability of highly secure virtual private network (VPN) technology. FedEx is currently in discussion with major wireless carriers such as AT&T, Cingular, and Nextel.

Besides the expected improvements in cost and coverage, going with a public wireless solution would allow the couriers to have wireless connectivity wherever and whenever it is needed. Currently, couriers deliver a package and then must return to their vans to transmit the data on their homegrown Digitally Assisted Dispatch System (DADS) handheld machines. "DADS communicates with a radio out of the van. With the handheld device that we are developing, [couriers] won't be tied to the van. They'll be able to connect wherever they need to," says Pasley.

CAMPBELL LAIRD

PROACTIVE EFFICIENCY

FedEx deploys both customer-facing and employee-productivity wireless applications throughout the enterprise. For example, the in-house development team is working on an application that will allow customers to interact with its system on their Internet-ready cell phones. When FedEx rolls out the application some time next year, customers will be able to track a package, find a FedEx drop-off location, and opt for proactive alerts of impending package deliveries—all for no extra cost. "It doesn't really help us if the customer isn't at home when we need to do a delivery [if a signature is required]," says Pasley. "Both the customer and the courier need to be aware." FedEx is also developing the ability for customers to look up shipping rates on their cell phones.

As for internal applications, FedEx is rolling out wearable wireless devices containing maintenance information on its fleet of aircraft. Says Pasley, "Instead of having to carry around those huge paper manuals, you can use one of these devices and look up the required maintenance." Adds Forrester's Gillett, "Wearable computers have a lot of 'wow' appeal."

The new Airbus planes used by the company are 802.11b-ready, Pasley notes, so FedEx will soon be able to know exactly what gate a particular package is destined to arrive at, even before the plane lands. "It's extremely efficient and proactive," says Pasley.

PUSHING THE ENVELOPE

Although FedEx has invested heavily in 802.11b wireless initiatives, it is experimenting with Bluetooth as a communications protocol within large package-handling facilities. "The main thrust behind this initiative is cable replacement. We don't want to have to have a cable between a scanner or printer and the wireless LAN. Today, we use wireless infrared to print. We have to dock them together. Bluetooth would eliminate that," says Pasley.

FedEx is also in the midst of a major push to upgrade the wireless capabilities of its international operations. "Our management wants our customers to have the same experience regardless of where they are located," says Pasley. This is a challenge because of the different regulatory environments and technology quirks abroad.

With a wholesale migration from a proprietary wireless network to a public wireless network in the works, along with numerous cutting-edge applications and an upgrade of international operations, Pasley is likely to have his hands full for some time to come. Says Pasley, "It's overwhelming sometimes. But at least it's not boring." ■

Lauren Gibbons Paul is a freelance writer in Waban, Mass. E-mail her at laurenpaul@mediaone.net.

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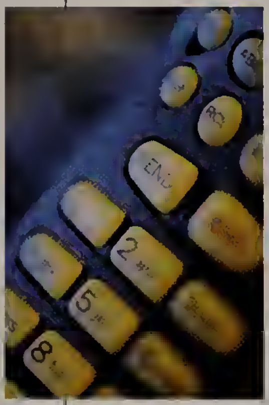
Gizmo Mania

Exploring your wireless networking options today will help you prepare for the future onslaught of new devices. BY DAVID KELLY

JUST AS PERSONAL COMPUTERS crept into the mainframe-only shops 10 years ago, enterprise network administrators are increasingly finding new wireless devices cropping up in their organizations. How can managers take control? By understanding what today's wireless devices can do, as well as by learning about the new wireless gadgets lying in wait.

HERE TODAY



Beyond the basic stand-alone cell phones and PDAs that dominate today's market and are meant for a single purpose, there's an increasingly broad array of devices with some type of built-in wireless networking. The popularity of these gizmos is exploding: International Data Corp. (IDC), Framingham, Mass., forecasts that the percentage of personal companions (i.e., super PDAs/phones) with integrated wireless networking (typically either Wi-Fi or Bluetooth) will grow from 1 percent in 2002 to 32 percent in 2005. (Wi-Fi is the consumer name for wireless LAN products based on the 802.11b standard. The majority of today's wireless LAN cards and base stations use the Wi-Fi standard. Bluetooth is an emerging standard designed to connect wireless devices such as phones, PDAs, and computers.)

Unlike what's just over the horizon, most of today's wireless devices have been built with a single (or limited) set of capabilities:

Cell phones—Over the past two years many cell phones have begun to include Web browsers that allow users to surf Web sites as well as place calls. However, these devices typically don't have the memory or functionality needed to run customized applications.

Personal Digital Assistants (PDAs)—In addition to the original "unwired" Palm-type devices, there is an increasingly broad set of PDAs with either built-in or optional wireless connectivity to the Web. Such connectivity is typically through a specific service provider and does not include connectivity to your corporate network (unless it's through a Web site).

E-mail-oriented devices—Since e-mail is so critical, some devices have specialized in making it easy to send and receive e-mail, leaving the phone and other functions out.

HERE TOMORROW

The next generation of wireless devices will be quite different from the single-function first-generation devices. Most vendors are including integrated or add-on access capabilities to standard corporate networks, typically through Bluetooth or Wi-Fi wireless standards. These standards allow wireless devices full access to the corporate network, increasing security risks and the need for proactive deployment strategies.

In addition, manufacturers are building many types of functions into a single device—possibly reducing deployment complexities. Among the wireless gizmos most likely to impact enterprise networks are the following:

Communicators—A blending of phones, PDAs, and computers, communicators combine a variety of messaging/voice/data capabilities with the ability to run (small) local applications. For example, recently announced units available early next year from the major PDA manufacturers integrate wireless phone, SMS (short messaging services), a Web browser, and, of course, an organizer into a single package.

Tablet computers—A hot item at recent conferences, tablet computers are designed to look like a pad of paper and act like a computer. Most designs include some form of integrated or optional enterprise wireless networking (Bluetooth or Wi-Fi), enabling users to interact seamlessly with corporate networks.

Devices based on Pocket PC 2002—The latest release of Microsoft's handheld OS has added new functionality such as Windows Terminal Server and SMS that make it appealing to network administrators, and some units have wireless connectivity (Bluetooth) built in.

Like it or not, new gizmos will be making their way into the hands of your users. By starting to learn about wireless networking options today, you can get a jump on planning for the latest wireless devices before they start sneaking into the organization through the back door. ■

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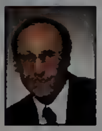

About the presenter:

Dennis Drogseth is a director at Enterprise Management Associates, a leading analyst and market research firm focused on management software and services.

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ENTER The Next Generation

UPS eyes massive rollout of scanners that combine Bluetooth, 802.11b.

BY LAUREN GIBBONS PAUL

WHEN IT COMES TO wireless technology, there are few bigger users than the United Parcel Service of America Inc. Like other shipping giants such as Federal Express Corp., Atlanta-based UPS was one of the first companies to deploy wireless, beginning in the late 1980s with its Delivery Information Acquisition Device (DIAD). UPS personnel use DIAD to track package deliveries in real time.

Thirteen years, three DIAD versions, and many lessons learned later, UPS now plans to standardize its fleet of in-building scanning hardware, a $100 million project called UPScan set to commence this summer. Currently in beta test, the company will deploy custom-built handheld machines that combine Bluetooth- and 802.11b-based wireless protocols to replace 55,400 miscellaneous scanners used by UPS personnel.

CUTTING SUPPORT COSTS

The standardization effort will significantly reduce the cost of supporting all those disparate devices, which represents the bulk of operating costs, says Joe Burdick, telecommunication network manager for UPS's wireless group in Mahwah, N.J . "It's tough to support all these different devices. We think we'll be able to remove a lot of the cost from this."

The project is particularly innovative in its combination of today's two most prevalent wireless protocols, Bluetooth and 802.11b. Bluetooth will be used to communicate with cordless peripherals, such as scanners, and 802.11b will be used to communicate with application servers. Symbol Technologies is supplying hardware for the project; Motorola Inc. is also involved.

When the deployment is complete, UPS officials expect the new devices—code named Emerald, which come in fixed-mount, wearable, and portable versions—to take the place of the currently more than 18 different types of wired and wireless scanning devices used by UPS personnel. The new devices will be used for most UPS applications, from package tracking to equipment monitoring to two-way communications.

A new version of the DIAD, version 4, will be out within the next few years. DIAD 4 will support 802.11b and Bluetooth. UPS is banking on both protocols being around for the long haul, says Burdick. "We want our devices to work five to 10 years out in the future. We don't want to cycle through technology in the next few years. We think these will be around," he says.

NO SURPRISES

UPS also plans to install advanced wireless LANs at all of its 1,748 package facilities worldwide. This undertaking is all the more complex due to the fact that UPS must conduct a survey at every site prior to installation to determine the site's suitability for radio frequency (RF) applications. "We tend to get a lot of surprises during the survey," says Burdick. For example, at one site a wall turned out to be insulated with shredded aluminum, which acted like a scrambler for the wireless data. And each center has a lot of equipment such as conveyor belts that can interfere with wireless data transmission. The goal is to get all the surprises out of the way before the installation.

"We expect [the wireless LAN] to be working on day one. We don't want to have a lot of shakeout," says Burdick. "Fortunately it's been going fairly smoothly so far." ■

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Teleworkers embrace instant messaging

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■ **BY JEFF ZBAR**

Olivier Sanche lives and works in Atlanta. He has reports in Colorado, Illinois, New York and California. His supervisor lives in Alaska.

That means upward of 70 office- and home-based workers in Sanche's department are spread across five time zones and thousands of miles. Often, team members' diverse schedules make for a chaotic workday. Sanche is often heading to lunch just as his supervisor begins his day, or is heading home just as the Alaskan is returning from lunch.

Enter instant messaging, the real-time text-based communication tool that Sanche — a twice weekly teleworker and district manager for AT&T's Network Operations and Engineering Training group — uses to navigate time zones and work hours. "Since the window of time in our 'office' is limited, [instant messaging] helps us coordinate things a lot better," he says.

Sanche and his team are a small portion of the 14,000 AT&T employees using the company's proprietary IMAnywhere messaging tool, which was built in 1998 for ATTWorldNet online customers. Today, employees use it to keep in touch, whether they're working in-house or remotely — more than half of AT&T's managers telework at least one day per week. "It's been effective at making the transitions between working in the office or at home seamless," he says.

Workers such as Sanche are part of a growing trend toward the use of real-time messaging in the corporate and telework environment. The number of corporate instant messaging users is expected to skyrocket from 18.4 million in 2002 to 229.2 million in 2005, with spending on such services to increase from $133 million to $1.1 billion, according to a recent IDC report. Already, 70% of firms have employees using the services, says Robert Mahowald, an analyst with IDC.

Mahowald says manufacturers have pushed application integration, so users can tie instant messaging into existing e-mail directories, and leverage the presence component out to mobile devices. "It is a way for mobile workers to feel as though they are really connected, and for employers to know that their workers are logged on and available," he adds.

Instant messaging grows legs

Free and simple, products such as AOL's AIM, MSN Messenger and Yahoo Messenger brought instant messaging to the mainstream. People began using them at home and the office, and realized the power of the tools for days they were working remotely or teleworking. With the masses have come more providers. Today, 25 real-time messaging products are vying for the corporate market (see a list of instant messaging products at www.nwfusion.com, DocFinder: 7844).

Moreover, products such as IBM/Lotus' Sametime, iPlanet, Comverse and even Microsoft Exchange 2000 have helped raise awareness in the business world and "give the industry some champions," Mahowald says. With champions will come standards for uniformity and differentiation among providers. Some will focus on bringing instant messaging to the masses. Others will deliver niche applications, such as portal-based services and partner, customer or affinity relationship management.

But instant messaging has not been without growing pains, as evidenced by the prevalence of consumer products being used in corporate settings — and the blurring of instant messaging for work and personal use. Even Sanche splits his instant messaging use in the office between formal office communication on IMAnywhere and informal chat with non-employee friends and family on ICQ, NetMeeting or MSN Messenger.

As a result, security is an increasing concern, especially in companies where remote and on-site employees use consumer tools to communicate. In January, AOL admitted there was a security hole in its AOL's Instant Messenger (AIM) service that could allow the introduction of malicious code into users' machines. Although many products support data encryption, when workers use them to chat with family and co-workers using consumer products residing outside the corporate firewall, they unwittingly could open security holes.

Even so, for remote workers, instant messaging can be a productivity boon. When on a lengthy conference call from home, Sanche might ping a co-worker for information he needs, the same as he'd slip an in-office colleague a note in a meeting room while on a conference call. Other users on his list know to use instant messaging rather than voice mail. Instant messaging also makes quick business of simple decisions; he scheduled an impromptu remote team meeting in less than 20 minutes recently. "That was a record," he recalls.

Sanche limits his instant messaging chit chats with co-workers — although he admits it works well to replace the water cooler atmosphere lost in the home-based environment. "We do occasionally ask each other about how things are," he says. "But it's mainly quick to the point and another tool to facilitate everyday life in the office."

Next step, uniformity

The confluence of features and benefits — like tying workers to one messaging tool and the ability to save message threads — has helped turn instant messaging into a productivity boon for business, Mahowald says, but only if it's used correctly. Between instant messaging and e-mail, workers create "twin collaborative silos" where messaging becomes fuzzy and untraceable.

Between heightened security issues and threads left unsaved on consumer services, companies are losing productivity, Mahowald says. "If it's lost on AIM server somewhere, that's not good. IT managers in midsize and large businesses have looked the other way. But it's becoming harder and harder to do so," he says.

What's more, the parade of consumer instant messaging products being used sap company productivity and jeopardize security. Take the case of Ross McKenzie, director of IS with the Johns Hopkins School of Public Health in Baltimore. Among the 4,000 people using the school network, many were using a variety of instant messaging tools in campus offices and from home, which created a generally chaotic and potentially insecure messaging situation. The lack of uniformity and reliance on outside providers with scant se-

See Instant messaging, page 26

IM needs analysis

Does your remote team use instant messaging? Examine how your team works and decide if instant messaging would improve or hinder its workstyle.

- **Are your typical messages short and actionable?** Instant messaging isn't designed for long queries or correspondence. Quick-hit messages work best.
- **What about the phone?** Some workers prefer it for short questions.
- **Does your corporate office use instant messaging?** If so, get the remote team to trial it and see how it works among members. If not, query IT to see if an instant message service is scheduled for introduction. If you plan to use AIM, Yahoo or MSN messenger services for your remote workers, check with IT to make sure you won't be breaching network firewall security.

Short Takes

■ **ZyXel** last week announced a new line of broadband security devices suited to small and midsize offices. Each includes stateful packet inspection firewall, denial-of-service attack protection and content filtering. Targeted to home offices and teleworkers, the **ZyWall 1** includes one IP Security VPN tunnel. For small companies and corporate branch offices, the ZyWall 50 includes 50 VPN tunnels. The ZyWall 100 provides 100 VPN tunnels and adds support for VPN protocols Point-to-Point Tunneling Protocol and Layer 2 Tunneling Protocol. Pricing is $300, $800 and $1,800, respectively. **www.zyxel.com**

■ The worldwide **Internet access devices** market — which includes PCs, mobile phones, set top boxes and smart appliances — is expected to grow at an annual rate of 41.8% through 2005, according to a recent forecast from Cahners In-Stat/MDR. While PCs and mobile phones make up 93% of this market, the report predicts the smart appliances market will grow the fastest, increasing at an annual rate of 100.8%.

Instant messaging

Continued from page 25

curity measures was creating a fertile bed for worms and viruses, he says.

"There was a concern [that instant messaging] was going to grow very big," McKenzie says. "We wanted to beat the curve before it got entrenched in here with five different flavors."

What's more, the school was installing a new portal for its faculty, staff and students, creating the ideal opportunity to launch one instant messaging platform and bring everyone in line. In August, McKenzie went with Bantu, a Washington, D.C., provider that stressed security and the ability to let users keep their consumer instant messaging accounts. This was important to McKenzie because many were already using consumer products, and getting them to migrate to a new system might have been difficult otherwise.

Whether it's traveling professors instant messaging colleagues in Baltimore or students pinging family back home — the system helps keep the university community connected while simplifying McKenzie's job. An occasional teleworker himself whose IT staff includes several part-time teleworkers — all of whom stay in touch using Bantu — McKenzie is pleased.

"This is much easier for everybody," he says.

Personality rules

As McKenzie learned, whether workers adopt a new instant messaging service depends a lot on personal preference. Mahowald, who frequently teleworks from his home 25 minutes from his office, has tested many consumer and commercial instant messaging products. He acknowledges instant messaging is great for dispersed teams that need to stay in touch, share information quickly or just keep the team spirit alive. The application of colors, icons, a friendly interface and tools such as conferencing, document sharing and presentations help facilitate team use.

Yet for personal use, Mahowald isn't sold on instant messaging and sees it as just another leash to the network. "It's not part of my constitution. My thoughts don't come so quickly that they can't be represented by e-mail," he says.

Even so, instant messaging has been a good fit for the 23 home-based caseworkers and 25 corporate-office staffers at M Hayes and Associates, a Baltimore disability case management firm with offices in Richmond, Va.; Fairfax, Va.; and throughout Pennsylvania. In August, the company began using WiredRed Software's e/pop 3.0 running on its Citrix servers to network caseworkers and patient cases, according to Nick Reich, the company's director of IT. M Hayes used to rely on e-mail for keeping remote and in-house workers in touch.

Simple to launch and easy to manage, WiredRed took Reich only 20 minutes to set up and standardize; his workers spent just a few minutes more learning to use it. Now, they instant message requests for files, patient data, forms and such — all of which would have previously been made via a long-distance call. When an insurance provider approves a new patient's referral or benefits, the caseworker is now notified immediately. The caseworker can in turn notify the patient the same day. Quality assurance and client satisfaction improves as the efficiency in delivering cases increases, Reich says.

It's simpler and less formal than e-mail, he adds. "You don't have to launch Outlook or look for someone's e-mail address. It's a lot less of a pain to use," he says.

Case management is especially important as the company seeks to comply with patient confidentiality and file management procedures related to the Health Insurance Portability and Accountability Act of 1996, Reich says. With WiredRed, content stays on his server. His only weak link is that some employees use Yahoo and other instant messaging products to chat with family and friends.

But that won't fly in the near future, he says, adding, "We can't have any leaks in data. It's got to be like [CIA headquarters] Langley around here." ■

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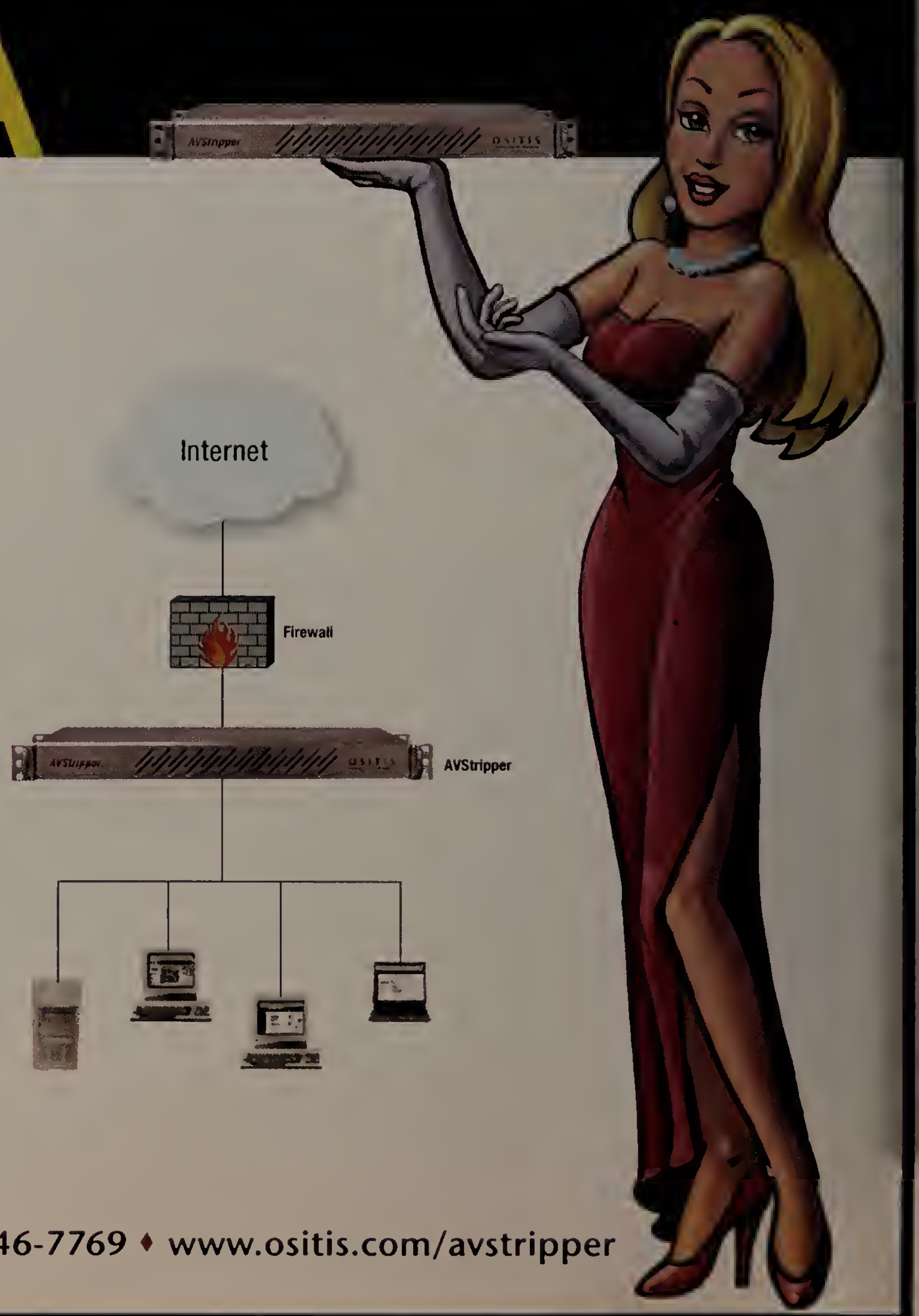

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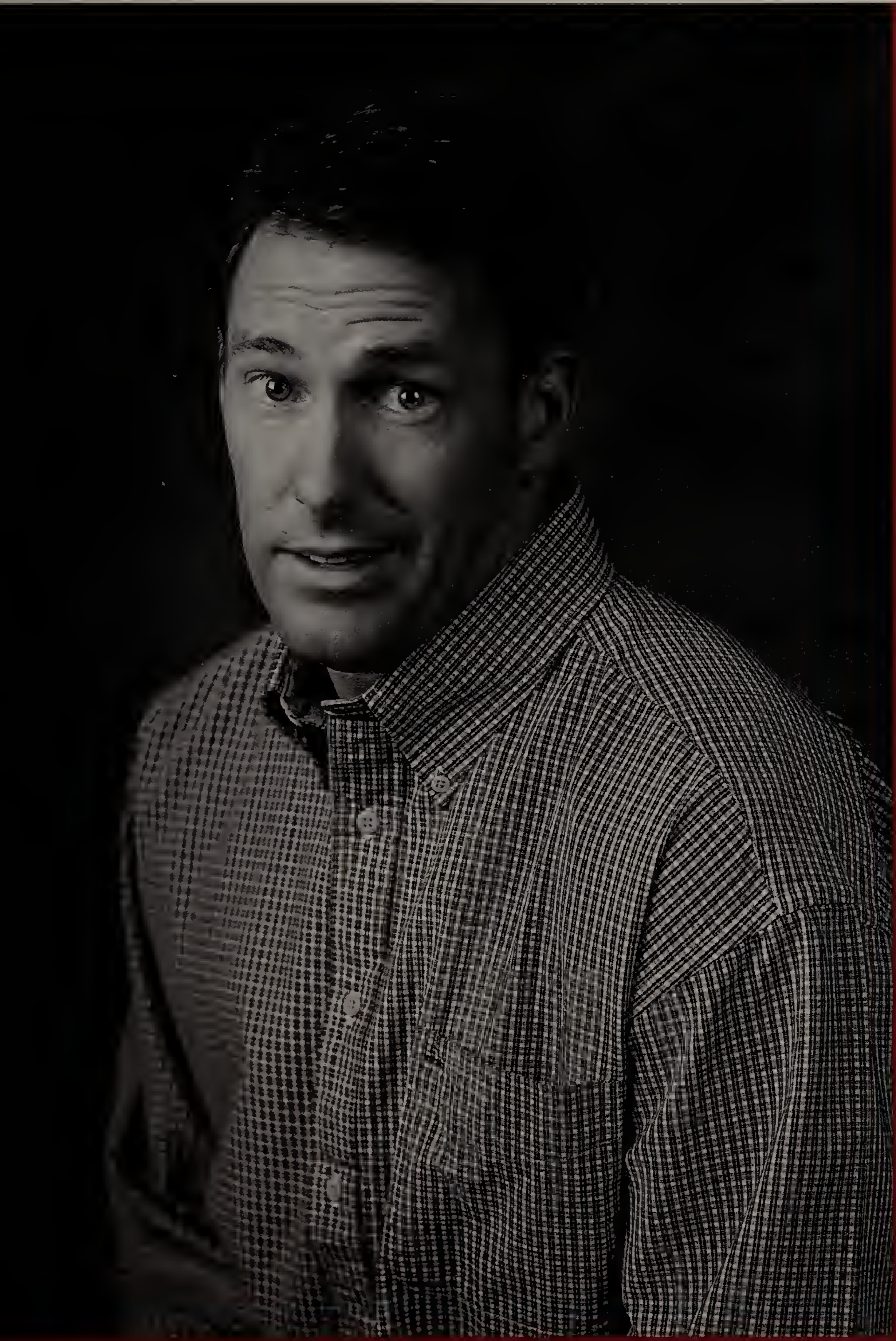

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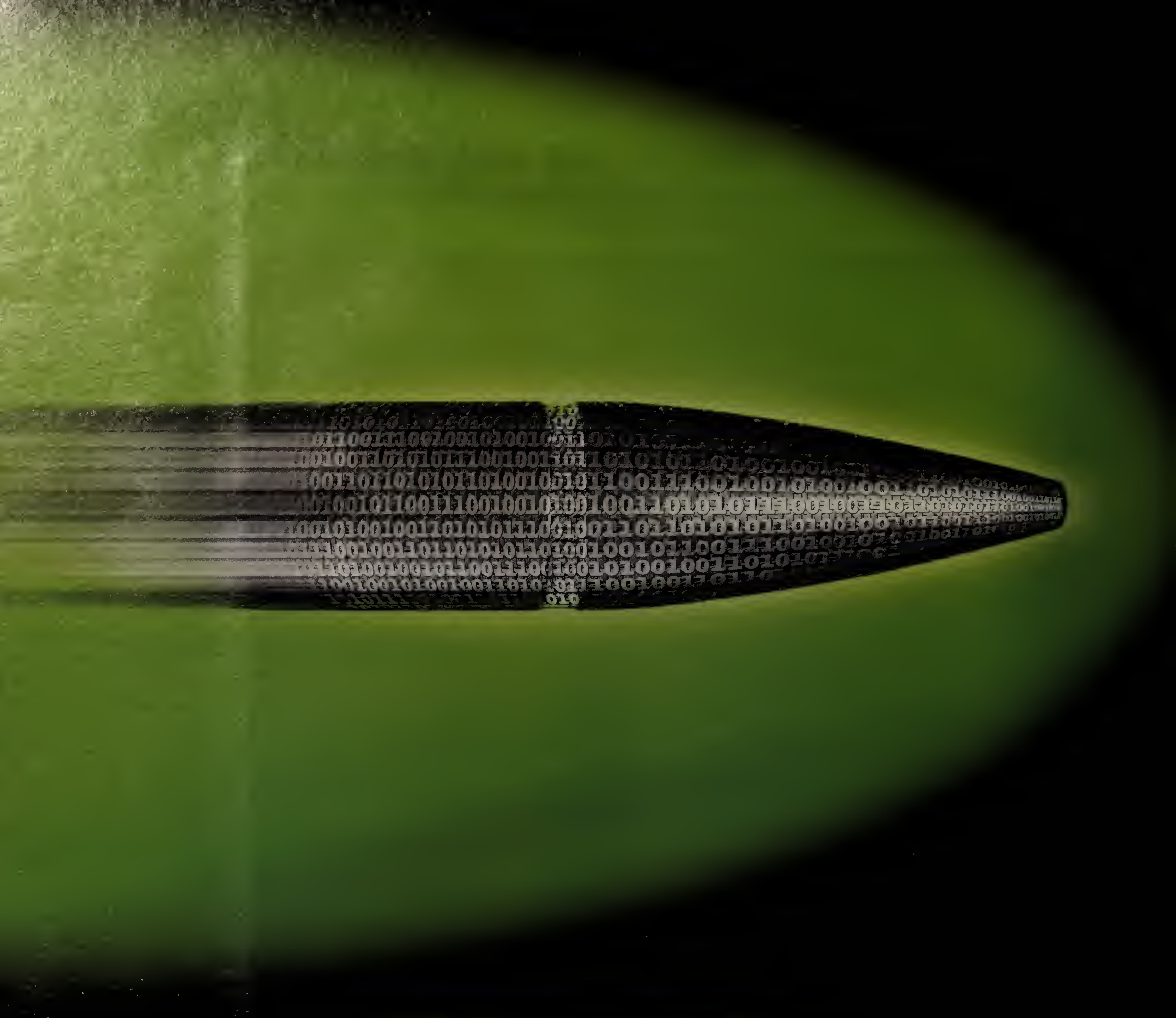

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Short Takes

■ **Oracle** last week took the wraps off a feature it says will be an important part of its **E-Business Suite: Oracle Daily Business Close,** a tool intended to offer executives a daily rundown on key metrics across all lines of their business. Daily Business draws on Oracle's E-Business Suite database to deliver reports drawn from various applications.

Oracle likens the reports — which are to be viewed in a Web browser and can be set up to display information relevant to the reader — to a daily newspaper covering a company's operations. Daily Business Close will ship as part of the Oracle E-Business Suite's Business Intelligence offering within 60 days. Pricing has not been announced.
www.oracle.com

■ **IBM** last week updated its management software for Intel-based servers, giving users a host of new automation and error-checking tools that could help reduce administration costs, the company says. **IBM Director** Version 3.1, which will ship with all xSeries servers, brings some diagnostic and installation features found on higher-priced hardware down to IBM's lower-cost Intel-based server line.

Users now can run server diagnostic checks while the hardware is still running. Previously, the system had to be down or offline. Users also can monitor a variety of performance metrics on their Windows servers without shutting down the system. Another new tool will let customers monitor parts of the hardware, such as power supplies, hard disks and fans, to see if any components are showing warning signs of a possible failure. Director 3.1 also sends out alerts when resources such as computing power or memory are running low. Users of Director 3.0 will be able to upgrade to the new version via a download on IBM's Web site.
www.ibm.com

Retailers juggle IT priorities

Trimming expenses helps pave the way for new technology rollouts.

■ BY ANN BEDNARZ

NEW YORK — When Butch Jagoda of Helzberg Diamonds wanted to build a data warehouse to consolidate the jeweler's data sources, he knew it would be tough to sell the project to corporate executives. So he built a sample interface for the proposed data warehouse to show what features could be available if the project was funded.

"Once we were able to demonstrate how easy it was to pull all this information together, aggregate it and present it at the various levels the organization needed in order to drive the business, it wasn't even a question," said Jagoda, vice president of IT. "Presenting the end result before we built the infrastructure is what got us to where we needed to be."

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With a little creativity, retail IT executives such as Jagoda are finding funding for key IT projects, even as budget contractions eclipse some of their lower-priority plans. Jagoda and other executives shared their tactics for stretching IT dollars with attendees at the National Retail Federation show earlier this month. He was joined by three other panelists: Bill Finefield, CIO of Navy Exchange Service Command (Nexcom); Judith Formichella, vice president of IT for retail at Polo Ralph Lauren; and Judy Straus, vice president of IS at Brooks Brothers.

> **"Take low-hanging fruit and drive costs out of the operation, but not at the expense of mission-critical, strategic projects."**
>
> **Butch Jagoda**
> Vice president of IT, Helzberg Diamonds

Surviving cuts

Thanks to a compelling pitch, Helzberg Diamonds' data warehouse survived cutbacks, as did a Web architecture overhaul and plans to finish rolling out broadband access to the stores. However, a wireless network didn't make this year's cut, nor did some application development tools deemed extra. There also won't be any extra IT hands at Helzberg Diamonds, as Jagoda expects his head count to remain flat this year. "Take low-hanging fruit and drive costs out of the operation, but not at the expense of mission-critical, strategic projects," Jagoda said.

Finefield, too, is working to trim expenses while preserving key application and infrastructure upgrades at Nexcom, the Naval contractor that runs 112 stores serving U.S. Navy personnel around the globe. "This past year we renegotiated our network contracts and covenants in the continental United States, and that resulted in doubling our minimum bandwidth and lowering our costs by 35%," Finefield said.

His No. 1 priority this year is implementing a new merchandising system. The project's scope includes infrastructure upgrades to support the new merchandising software, such as bolstering Nexcom's wireless network to support the 802.11 standard. A new point-of-sale system also is in the works.

Making things tougher is that Finefield may have to make do with fewer personnel this year, as he expects Nexcom will downsize. Cutbacks notwithstanding, he said the current economy has helped stabilize Nexcom's IT staff. "We tend to have a significant turnover rate, and that has dropped because of the environment," Finefield said. "I want to take advantage of that to rebalance the organization and improve the quality of training, experience."

Mandatory ROI

At Polo Retail, demonstrating measurable, traceable return on investment

See Retail, page 32

Network execs look to mgmt. tools for answers

■ BY SANDRA GITTLEN

James Tate and Jerry White have big challenges ahead of them. For Tate, it's figuring out how to set up a bandwidth-on-demand network to 450 buildings from a centralized location within the next few years. White has to decide what parts of his network are underutilized and need to be turned off.

These network executives plan to attend *Network World's* Performance and Availability Management Seminar series next month to gather information to solve their diverse dilemmas. The executives are looking to hear how tools from companies such as Concord Communications, Hewlett-Packard, Tavve Software and NetQoS let them visualize the network and its gear, and boost quality of service and application performance throughout the network.

Tate, assistant deputy director for tele-

See Seminars, page 32

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Well, not quite. A website is not a portal. And even if it was, a portal is not an e-Business.

Portals and websites along with application servers, databases, customer relationship programs, automated supply chains, an efficiently connected field force and the rest of your back office are all vital components of an e-Business. It's making them work together that's the trick.

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WORKS BETTER WHEN EVERYTHING WORKS TOGETHER™

A trustworthy computer company?

'NET INSIDER

Scott Bradner

In a revelation being likened to the one preceding his 1995 e-mail message that told the folks at Microsoft that the Internet was something to keep in mind, Bill Gates now understands that security would be a good thing to have in Microsoft products.

In a message sent to Microsoft employees earlier this month, Gates pushed the philosophy of "Trustworthy Computing" and exhorted employees to keep security foremost in mind when creating programs. This is good stuff; it's just sad that the revelation is about a decade late. But if Gates can get the Microsoft rank and file to pay attention, it will be very good for the Internet.

It's not that there haven't been signs that Microsoft had badly missed muster when trying to balance the desire to make its software easy to use and the need to make it somewhat secure. The many millions, or, if you believe the trade press, billions of dollars that businesses in the U.S. and around the world have spent cleaning up after a seemingly never-ending series of e-mail-based viruses should have provided a hint before now. So should have the security patch of the week that needs to be applied to Windows systems to keep high school hacking clubs from taking down corporate America. It's interesting that the Gates memo does not mention the ease-of-use problem with security. It mostly focuses on adding features: "When we face a choice between adding features and resolving security issues, we need to choose security." This is the right thing to do, but it's not enough.

If Gates can get Microsoft to follow through on his memo, future generations of Microsoft software will be more secure and the 'Net will be a more secure place as a result, but it will not be easy. Press reports say that internal Microsoft security teams have been told by some product developers to not bother them. But Microsoft does have some advantages: Other press reports say salary and bonuses for Microsoft applications developers will be tied to the security of their products.

Reports say salary and bonuses for Microsoft applications developers will be tied to security.

Gates seems to understand Trustworthy Computing is not just about security. In his memo he lists availability, security and privacy. It's a bit worrisome that he includes a comment in his paragraph about availability that there should be "service resumption without user intervention in almost every case." I'd rather the stuff did not crash in the first place. I am happy about his aim on the privacy front: "Users should be in control of how their data is used," although this might not be totally in sync with some of the recently reported features of Internet Explorer and Windows Media Player.

Trustworthy Computing, Gates says, "is computing that is as available, reliable and secure as electricity, water services and telephony." That is a tough goal considering where Microsoft is today, but it's the right thing to strive for. I just hope the company can do as good a job of this as it has of making its software overly helpful.

Disclaimer: Overly helpful is what some people say about Harvard, but this memo review is mine alone.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Retail

continued from page 29

"I don't see how you could ever cost justify a new point-of-sale system . . . They are core packages you need to buy. That's the cost of doing business."

Judy Straus
Vice president of IS, Brooks Brothers

(ROI) is mandatory for all IT projects, said Formichella, who joined the retailer in November. Her capital budget likely will grow over last year's rate; however, she is charged with trimming expenses by 5%. "Quite frankly, I can do better than that," Formichella said, citing maintenance of old systems as an area where money could be better spent.

Formichella is looking to consolidate Polo Retail's disparate data sources into a single data warehouse, she said.

"When I look at the total cost of ownership for all of these four or five individual data repositories, I'm sure that I'll come up with the money to justify one enterprise solution," she said.

Polo Retail also will spend on supply chain management upgrades and look to standardize its global systems.

Of the four panelists, only Formichella expects to add IT staff in 2002. "The level that we'll be adding will be project managers and subject matter experts in order to staff the capital projects," she said. "I certainly won't be adding staff to maintain the current application suite."

Capital restrictions

Capital budgets are more restrictive at Brooks Brothers, particularly after Retail Brand Alliance acquired it last year. Many IT purchases are on hold as the businesses investigate how they can consolidate systems for greater efficiencies, Straus said. Brooks Brothers also may trim its IT staff if its acquisition results in overlapping resources.

On the positive side, low IT activity has given Straus and her team an opportunity to tackle back-burner projects, such as software for the alteration group and tie-ins to transportation-provider systems. "Most people get involved in the high-priority projects — when do you ever get to see the second, third, fourth people on the list?" she said. "We took advantage of doing that last year."

As Brooks Brothers works with its new parent, Straus said the businesses would look to capitalize on their mutual vendor relationships. "I'm sure there's a great amount of efficiencies and money to be saved there," she said.

In terms of ROI, Straus will spend her time championing IT projects such as developing a new data model for aggregating customer information and creating targeted marketing campaigns — projects that are more subjective than "must-have" transactional systems, for example.

"I don't see how you could ever cost justify a new point-of-sale system or a new merchandising system most of the time," Straus said. "They are core packages you need to buy. That's the cost of doing business." ■

Seminars

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com at Presidio Trust in San Francisco, says performance and availability management tools are critical for his job. He has been charged with developing a state-of-the-art network that interconnects a collection of more than 2 million square feet of commercial space and 1,200 residences. Tate wants to model the network he is building as a service provider operation, he says. "We want to provide carrier-class access to individual tenants," he says.

To make network adjustments easier, Tate wants to install performance and availability management tools that will increase or decrease a tenant's bandwidth based on his traffic needs and issue reports on how the network and its applications are performing.

White, senior network engineer with global retailer Gap in San Francisco, has almost the opposite challenge. Instead of ramping up his network, White says performance and availability management tools, such as those he's using from Lucent and Micromuse, will help him figure out where he has overprovisioned.

"We thought we needed this bandwidth, that the applications were going to need the bandwidth," he says. Last year, the Gap began an aggressive buildout of its network infrastructure in anticipation of high-end and bandwidth-intensive point-of sale applications that were under development. The company signed three-year service contracts with its carriers and bought high-speed routers from Cisco, along with costly maintenance plans.

But the wide-scale rollout of the POS application didn't happen and the Gap stopped short of its planned expansion to 6,000 stores worldwide. The new applications that did roll out don't use even a fraction of the bells and whistles they featured, including advanced language tools, and therefore don't need as much bandwidth.

Because switching carriers and canceling contracts can cost big bucks, he says he expects performance and availability management tools will help him pinpoint exactly which links and equipment are severely underutilized. ■

■ For advice on picking the right performance and availability management tools, see PAGE 46.

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Pulling profit from the Internet

Cisco midrange routers help customers make the most of their Internet opportunities

WHETHER IT'S E-COMMERCE APPLICATIONS, customer service, supply chain management, e-learning or work force optimization, the Internet presents unlimited opportunities for businesses to lower their costs while improving productivity, customer care and, ultimately, profitability. Internet technology also enables companies to maximize their network investments by converging all forms of content onto a single network, enabling the same IP infrastructure to handle voice, data and video applications.

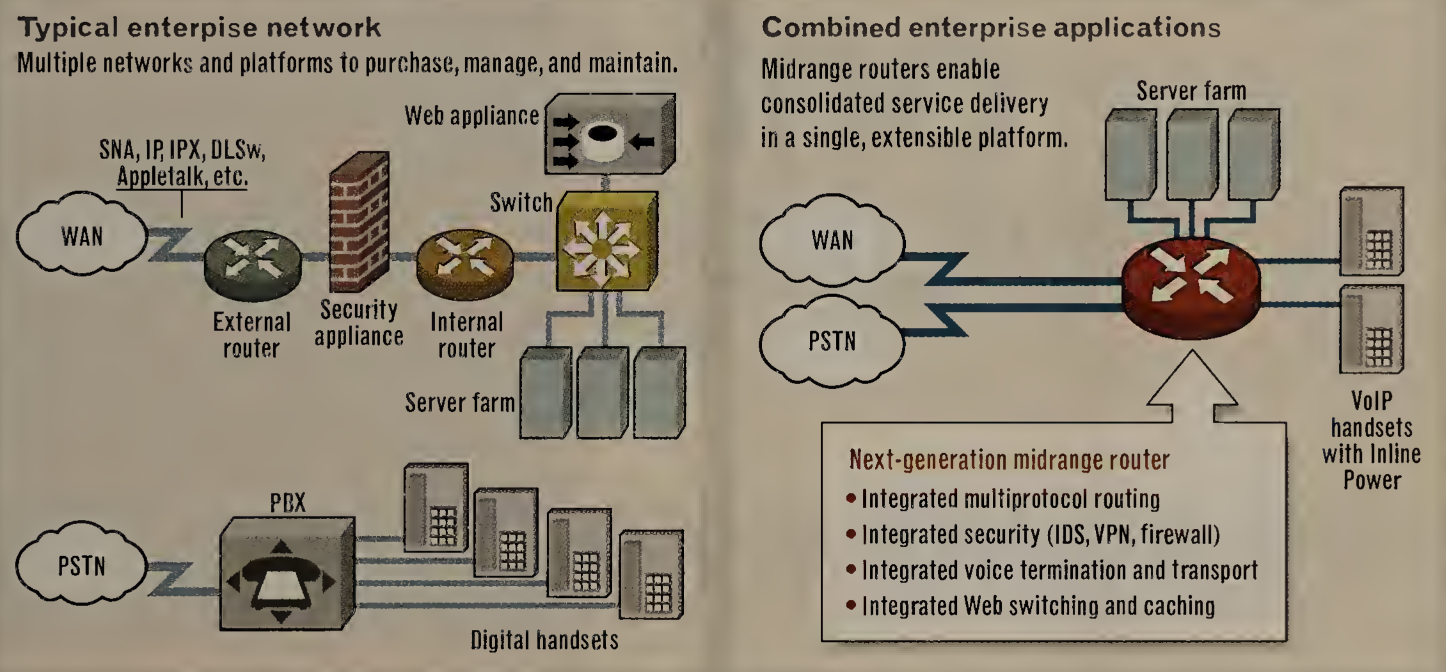
Taking advantage of all these Internet opportunities requires an IT infrastructure that is highly reliable, flexible in terms of the services it can support, and scalable, so it can grow as the enterprise becomes more successful. The Cisco midrange routing family is uniquely positioned to enable enterprises to meet all these goals.

Cisco midrange routers include the award-winning Cisco 7200 and 7500 Series as well as the recently announced Cisco 7300, 7400 and 7600 Series Internet Routers. These routers are designed to fulfill a number of requirements at the WAN edge, efficiently routing campus network traffic across metro- and wide-area service provider links while giving each application the priority, features and services it requires.

"To successfully meet all those requirements, an edge router has to handle a combination of hardware, software, and applications," says Seenu Banda, Senior Director of Product Marketing for the Cisco Midrange Routing Business Unit. "The router must be able to differentiate among packet types by supporting features such as quality of service (QoS), so that voice, data and video applications each get the level of priority they need. Similarly, edge routers should play a role in an enterprise's security plan, offering services such as firewalls, intrusion detection, IP Security (IPSec) encryption, virtual private network (VPN) capability, and access control lists (ACLs), which enable customers to control access to applications, data, and services."

MIDRANGE ROUTERS CUT COMPLEXITY AND COSTS

Cisco midrange routers enable enterprises to converge multiple applications onto a single network infrastructure, reducing complexity and cost of ownership while increasing deployment and training leverage.


Typical enterprise network
Multiple networks and platforms to purchase, manage, and maintain.
Web appliance
SNA, IP, IPX, DLSw, Appletalk, etc.
WAN
Switch
External router
Security appliance
Internal router
Server farm
PBX
PSTN
Digital handsets
Combined enterprise applications
Midrange routers enable consolidated service delivery in a single, extensible platform.
Server farm
WAN
PSTN
VoIP handsets with Inline Power
Next-generation midrange router
• Integrated multiprotocol routing
• Integrated security (IDS, VPN, firewall)
• Integrated voice termination and transport
• Integrated Web switching and caching

Cisco midrange routers handle all those functions in a portfolio of flexible platforms, each of which allows customers to incrementally scale their systems to meet burgeoning requirements, while providing investment protection. A single box can handle WAN requirements from DS0 to OC-48 while supporting LAN links ranging from Ethernet to Gigabit Ethernet. In fact, most models come with built-in dual Gigabit Ethernet ports, providing high-speed LAN connectivity at no extra cost.

A profitable model for any enterprise

While the Cisco 7200, 7400 and 7500 Series provide up to T3 connectivity with an OC-3 uplink, the Cisco 7300 and Cisco 7600 Internet routers fulfill requirements for the growing number of enterprises that need connectivity to OC-48.

"As companies look to add bandwidth-intensive applications like video and take advantage of the Internet to deploy advanced applications, they require increased performance," Banda says.

The Cisco 7600 offers the LAN performance and density of the Cisco Catalyst® 6500 Series platform along with enhanced WAN capabilities in terms of performance and connectivity options. With WAN connections that range from DS0 to OC-48, the Cisco 7600 enables enterprises to aggregate connections to remote users, branch offices, and business partners, and makes an ideal single platform for the data center or the fast-growing Ethernet MAN.

The Cisco 7300 is an excellent choice for enterprises that require medium- to high-speed connections to a service provider. It delivers high-touch IP services at the optical speeds necessary for enterprise applications, all in a compact and modular form factor.

The Cisco 7400 is a one-rack unit that is an ideal option for application-specific requirements, such as high-performance QoS processing or connecting a customer premise to the WAN. It has the same high performance and suite of software features as the other midrange offerings.

Applications that add value

All the midrange routers are part of the Cisco Architecture for Voice, Video and Integrated Data (AVVID), enabling enterprises to consolidate separate voice and data networks and support Internet applications.

What makes all this possible is the rich suite of applications supported on Cisco midrange routers. Building on a history of innovation, Cisco debuted on its midrange platforms applications such as voice packet termination, QoS for packet voice, Layer 3 Multiprotocol Label Switching (MPLS), and SNA over IP. Collectively, such features enable enterprises to consolidate what once were separate networks for voice, IP, IPX and SNA, garnering savings in capital as well as operational costs.

Cisco is continuing this tradition of innovation, adding support in its midrange router line for applications that address today's requirements, including:

- **Security:** Cisco midrange platforms add to enterprise security by supporting services including firewalls, intrusion detection and MPLS VPN.
- **ACLs:** ACLs enable Cisco platforms to support a highly granular level of control over access to applications and services.
- **Web content:** Web content recognition, switching, and caching capabilities help ensure that the network can deliver content to end users, including video.

The Cisco Parallel Express Forwarding (PXF) architecture plays a key role in ensuring that all these services are supported without compromising performance. Packet forwarding, filtering, QoS, ACLs and other specialized functions are performed in ASICs, meaning there is no effect on central processor utilization. PXF processors are also programmable, enabling Cisco to add new and enhanced services through software upgrades as opposed to the far more time-consuming process of adding new ASICs. And each midrange platform supports redundant route processors, ensuring high reliability.

In short, with their range of LAN and WAN interface options, a choice of chassis to support current and future requirements, unparalleled performance, an array of application support and investment protection, Cisco midrange routers enable customers to increase productivity while maximizing return on investment by taking full advantage of the untapped wealth of Internet opportunities.

For more information visit www.cisco.com/go/midrangebrochure.

WORLDCOM.

today's business thought:

they say it's the perfect VPN for your company.

it's the only solution they sell.

coincidence?

Of course not. Some VPN providers will say anything to convince you that their one existing solution meets your many existing security needs. But WorldCom takes a different approach.

We believe your business should have a solution that fits perfectly. One that adjusts as your security needs change over time. That's why we've designed adaptable VPNs that integrate seamlessly. Whether it's across our UUNET IP backbone, across our 100% dedicated, private IP backbone, or across our traditional frame, ATM and private line networks. And they work with a wide array of access speeds and types, including DSL and wireless transports. Which means you can reach your network securely from virtually anywhere, anytime.

So instead of constraining your applications within the limits of your VPN, why not get a VPN with unlimited potential for your business?

Find out how to save now on secure, WorldCom IP VPN Remote access. Visit worldcom.com/us/library for more promotion information.

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ServiceProviders

- THE INTERNET
- EXTRANETS
- INTEREXCHANGES AND LOCAL CARRIERS
- WIRELESS
- REGULATORY AFFAIRS

Short Takes

■ **AT&T Wireless** recently sold its fixed-wireless assets to **Netro** in a cash and stock deal. Netro agreed to pay $16 million in cash and 8.2 million company shares for the fixed-wireless technology, a license to intellectual property, equipment and software. Netro, a wireless equipment vendor, is not buying rights to the 47,000 customers of AT&T Wireless, which is in the process of moving those users onto other service provider networks.

■ **The Federal Communications Commission** intends to fine **SBC Communications** $6 million for violating a condition of its 1999 merger with Ameritech. According to the FCC, SBC failed to meet a merger condition related to offering competitors access to the local phone network in the five states where Ameritech operated: Illinois, Indiana, Michigan, Ohio and Wisconsin. The agency says SBC was not offering competing phone companies favorable terms for access to its network, as the merger condition stipulated. SBC refutes the commission's findings. "SBC has met our obligations under the SBC/Ameritech merger conditions to provide competitors with shared access to our networks in the Ameritech region and elsewhere. That's one reason why [competitive local exchange carriers] are serving 12 million access lines in our territory,"a company statement said. SBC has 30 days to pay the fine or respond in writing to the FCC; the company plans to take the latter route.

■ Wireless service provider **Nextel Communications** plans to work with **IBM** to develop e-business applications for mobile devices, and will also outsource its customer care center operation to an IBM subcontractor in a $1.2 billion outsourcing deal. IBM has reseller relationships with other carriers, but this is the first deal in which IBM will be jointly developing new wireless e-business applications with a wireless carrier, IBM says.

Q&A EDS exploits shifts in hosting arena

As the Web hosting market falters, traditional outsourcers are picking up the pieces. Electronic Data Systems, for example, has expanded its data center expertise to include Internet connectivity. The company says 77% of the $19.2 billion in revenue it reported last year came from its I-Solutions business, which includes Web hosting. Network World *Senior Writer Jennifer Mears recently spoke with Steve Lapekas, vice president of hosting services for EDS.*

How does EDS fit into the Web hosting market?

Web hosting is a natural extension of EDS' business. We didn't have to go out and build data centers. We have 12 major service-management centers. EDS is 40 years old and we've been doing hosting and data center operations since the beginning. Exodus has 44 data centers and 5.6 million square feet of raised floor, compared with EDS' 12 data centers and about 1.4 million square feet of raised floor. It's not the quantity of space you have; it's the quality. And the quality is the managed services; it's the revenue you generate per square foot that keeps you in the business.

Do companies understand what EDS offers for Web hosting?

A lot of clients are turning to us because of our stability, because of our experience. It's the work that we do above the operating system level. That's where the market is going; it's very application-centric. The static Web site of yesterday is gone. It's all dynamic assembly now. It's reaching back into databases; it's reaching back into legacy systems. That's really where there is a separation between us and who is left out there.

Obviously IBM Global Services is very big and has capabilities similar to EDS. After that you have the Digexes of the world, and maybe even Genuity, and they have their issues.

But after that there's a very large gap. The only ones with the money to stay in the market are your [telephone company]-type providers. But they base themselves on the central office scenario, the facilities core, and so when

See EDS, page 36

Akamai speeds service from the edge

■ BY JENNIFER MEARS

CAMBRIDGE, MASS. — Content delivery company Akamai Technologies, which recently revealed plans to offer services for corporate intranets, is boosting its service on the Internet.

Akamai recently announced it has deployed its edge delivery servers within ISP EarthLink's network. The alliance between the two service providers follows a trial period demanded by EarthLink to ensure that the Akamai servers would not disrupt the ISP's service.

EarthLink "had gone through a lot of due diligence to ensure that sticking Akamai boxes in their network wasn't going to disrupt them in any way, shape or form, and obviously they decided that they won't," says Neal Goldman, an analyst with The Yankee Group. "From Akamai's perspective it's a vote of confidence."

Akamai also got a show of support from managed hosting provider Digex, which announced that it would resell EdgeSuite, Akamai's dynamic content delivery service. That's good news for Akamai, which is finding that many managed service providers see the content delivery network as a competitive threat, Goldman says.

By offering Akamai's EdgeSuite service, Digex is enabling customers to push more content and application processing out to the edge, reducing the demand on origin servers and improving Web site performance, analysts say.

Akamai has more than 13,000 caching servers that sit at the edge of more than 1,000 networks in 63 countries and distribute content and applications from servers geographically closest to end users, reducing download times and network congestion. The network also reduces the demand on origin servers because content requests can be fulfilled at the edge of networks rather than in data centers.

With the addition of EarthLink, Akamai's customers will have greater reach, and EarthLink's customers will benefit from faster downloads and better-quality content from companies using Akamai services, the companies say.

As for Digex, the managed hosting provider will offer EdgeSuite as part of an integrated package of hosting services and will team with Akamai to offer setup and support for customers using the EdgeSuite product.

Digex has been offering Akamai services to its clients since 1999, when it began providing Akamai's FreeFlow service for the delivery of static content. It began offering Akamai's streaming service in 2000. ■

www.nwfusion.com

More online!

Akamai claims managed service EdgeSuite will protect infrastructure and virtually guarantee the site's availability 100% of the time.

DocFinder: 7837

EYE ON THE CARRIERS

Johna Till Johnson

Technologies that will shape carrier services

Last week we looked back at a handful of technologies that didn't pass muster over the past decade. Today, we'll take a look at technologies that promise to reshape carrier services over the next few years.

• **Broadband local loop.** DSL vs. cable? Ancient history. For next-generation local-loop technologies, the dynamic duo is fiber and wireless. While fiber to the home will take decades to roll out, deployments are under way in many major metropolitan areas. Some cities are even covering the cost of pulling fiber — treating it effectively as a public utility — and selling service providers the right to offer services across that pipe.

Meanwhile, service providers are exploring wireless broadband offerings based on technologies such as vector orthogonal frequency division multiplexing (VOFDM), promoted by the Broadband Wireless Internet Forum, which promises multimegabit connectivity without requiring line-of-sight links. Additionally, 3G technologies are promising similar speeds, coupled with the ability to roam.

Who wins? Whoever can offer the service cost-effectively enough to make money, roll it out fast enough to meet user demand, and deliver services of high enough quality to keep complaints low. One thing's for certain: There will be plenty of action in this market for years to come.

• **Reliable multicast.** Why is multicast such a big deal? Many of my clients are financial services companies that have a defined need for (and more importantly, a lot of money riding on) the ability to transmit trading and pricing information to a specialized group of recipients. Reliable multicast is an obvious fit for them, and they've been among the early adopters. Service providers supporting this specialized market have focused on multicast for years.

But why would service providers want to offer multicast services to the general public? Simple. Reliable multicast allows the service providers, at long last, to compete head-to-head with the broadcasting companies (radio, television, cable) by delivering subscription services such as games, interactive TV and audio jukebox services to select groups of users. Given that bandwidth is rapidly becoming a commodity, service providers have to find something else with high enough margins to sell.

• **Wireless middleware.** Yet another import from the financial services community, middleware enables applications to function reliably and effectively across disparate systems, with load balancing, security and scalability built in. Wireless middleware is key to extending corporate applications across wireless devices. This might, for example, enable a traveling salesperson to use a cell phone to check product inventories stored in a mainframe database.

You've heard this before — and many wireless middleware vendors have perished in the dot-com implosion. Netmorf went belly up last year, and MobileQ was picked up by ViaPhone. That doesn't change the fact that this kind of technology is required to make pervasive computing a reality. Companies like 724 Solutions continue to plow forward.

So in January 2012 when you come across this column while browsing from a middleware-enabled wireless device, give me a ring. We'll set up a multicast session and share a chuckle.

Johnson is senior vice president and CTO for Greenwich Technology Partners, a network consulting and engineering firm. She can be reached at johna@greenwichtech.com.

Q A

EDS

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you go above the operating system there are definitely limitations from the AT&Ts and Qwests of the world.

What sets EDS apart from IBM?

The quick answer is choice. They have collocation facilities, and obviously you can bring in all kinds of equipment. From a managed services perspective, the box is going to be blue. We have our existing alliances, but if you come into one of our data centers, we'll have IBM boxes, we'll have Hewlett-Packard boxes, we'll have Compaq boxes, we'll have Dell boxes.

We can do a lot of things under one roof. For instance, to do order fulfillment, you can go into our business process-management business and we have distribution centers around the county, around the world. An EDS employee can fill the cardboard box and send it out — all under one roof. If you are IBM, they fall short in order fulfillment, but they'll tell you they make the server.

Has your hosting strategy changed since the market has fallen apart?

Because we weren't in collocation, there wasn't any strategy change. My issue is, where do we take hosting next? What you'll see from EDS is more high-availability types of offerings; 99.95 to four of the five nines; zero-latency environments. Blade architecture that lends itself to, I hate to use word utility, but capacity on demand or rapid provisioning and deprovisioning. Web services are obviously a part of our future.

Who are your competitors?

Today, obviously IBM Global Services [and] Digex we see a lot in the marketplace. Twelve months ago there was everybody and their brother saying they could do Web hosting. Two things have happened: Obviously the economy; but also we've seen the need for complexity to emerge. It's no longer just three databases. It's three databases that have to be clustered, that have to be fully redundant, and how do you tie that in and how do you global load balance?

What are you seeing as far as demand goes?

Some want to do what-if scenarios: What if Exodus Communications shuts its doors, what can you do for me? EDS procures the hardware and it's part of our monthly charge. While you're running in a facility that might be about ready to shut its doors, we build the environment, we start swapping content, we flip the switch and you're operational. Companies are also asking for those complexity issues. They're asking for an integration piece to databases or back-end legacy systems, global load balancing-type scenarios.

Have you seen a drop in demand?

From a Web hosting standpoint, we've actually seen an increase in demand. It stems from the market. I'd like to say I'm the greatest Web hoster out there, but there are just fewer people who can do it. ■

Sprint service unites wireless/wireline calls

■ **BY MICHAEL MARTIN**

Sprint PCS last week unveiled a service designed to simplify the lives of enterprise employees using multiple phones.

Called Sprint PCS Integrated Office, the service lets employees forward their wireline and wireless calls to one voice mailbox and lets them set up the same abbreviated dialing codes for frequently called numbers on their wireless phones that they use on their wireline phones. Companies also can subscribe to a single-number feature that lets employees forward calls from their desk phone calls to their Sprint PCS phones.

Sprint includes a Web-based management tool with the service, so telecom administrators can add and delete numbers as employees join or leave the company.

An optional user-based tool lets employees filter their calls, deciding which calls will go straight to voice mail and which calls will be forwarded to the wireless phones.

Integrated Office should appeal to enterprise customers because it offers a useful service at a relatively low price, says Iain Gillot, president of wireless research firm iGillot Research.

Other wireless providers have tried to launch similar products, Gillot says, but those offerings required companies to invest in hardware that costs tens of thousands of dollars. Integrated Office requires no new hardware and starts at $4 per employee per month. What Sprint does instead is downloads a corporation's PBX numbering plan and integrates it with Sprint's wireless PCS network.

Integrated Office could also allow Sprint to grab a larger share of the corporate wireless market, Gillot notes.

"This only works well if all of a company's employees are on the Sprint wireless network, so from their point of view it's a great thing to do," he says.

Integrated Office is available. The service can scale up to 150,000 users in one corporation, according to Sprint.

Sprint: www.sprint.com

Cutting the call clutter

Sprint PCS Integrated Office comes in two packages:

Standard package includes:

- Abbreviated dialing.
- Single voice mailbox for all an employee's phones.
- Web-based management tool.
- A $4 per month charge per employee.

Expanded package includes:

- All standard-package features.
- A single number, which automatically forwards calls to desk phones to a Sprint wireless phone.
- Personal call controls let users filter messages.
- Group call controls let employers restrict the number of calls to or from a wireless phone.

The Edge

■ SERVICE PROVIDER DEVELOPMENTS
AT THE JUNCTURE BETWEEN THE ENTERPRISE
AND THE NEW PUBLIC NETWORK

Metro net standard efforts converge

■ BY TERRI GIMPELSON

The IEEE standard for Resilient Packet Ring may be closer to reality after the submission of a new proposal that evolved from compromises made by Cisco- and Nortel-led factions.

Dubbed Darwin, the proposal was to be voted on by an IEEE 802.17 working group Jan. 25 (after press time). If approved, the proposal will have to work its way through an IEEE standards process that likely won't produce a ratified standard for about another year, although observers say it should be safe for carriers to start installing prestandard equipment and upgrade the software or hardware later.

RPR has gained attention among carriers and equipment suppliers looking for a better way to offer high-speed Ethernet-based services across metropolitan-area networks. RPR, which will be supported in switches and other gear, is intended to optimize metropolitan ring topologies for packet transport with resiliency matching or exceeding SONET's.

The new Darwin proposal incorporates the best of Cisco's and Nortel's plans with the intent of reaching a broader consensus, according to John Hawkins, a Nortel marketing manager. While the original proposals haven't been yanked off the table, it's clear from discussions with Cisco and Nortel officials that Darwin has supplanted their respective Gandalf and Alladin pitches. Slews of other companies, including Appian Communications, Intel and Riverstone Networks, have also thrown their support behind Darwin.

The changes the group made in developing Darwin focus on two areas: bandwidth management and failure protection.

"Within this algorithm, there are ways to adjust network performance depending on the amount of congestion in the network at any given time," Hawkins says. "This allows network operators to be more proactive about network management."

According to Hawkins, the Gandalf pro-

See Darwin, page 38

Resilient Packet Ring evolves

The IEEE 802.17 working group has come up with a compromise proposal based on parts of the Cisco-led Gandalf document and the Nortel-led Alladin proposal.

Darwin:

- Technological issues revolve around two areas: bandwidth management and protection.
- Specifies a bandwidth management algorithm that allows for proactive adjustment to improve network performance. Other proposals do not have such an algorithm.
- Allows for two separate protection methods to be used on the same network — steering and wrapping. The other proposals only allow for one or the other.

Gandalf:

- Uses a fairness scheme for traffic management purposes.
- Is based on Cisco's Spatial Reuse Protocol technology, a new generation transport technology.
- Calls for the use of a new packet format.

Alladin:

- Uses virtual output queuing for traffic management.
- Uses a more complex media access control scheme for traffic management.
- Uses the same packet format as Ethernet with an additional RPR tag.

Short Takes

■ **Redback Networks** last week announced that its **SmartEdge 800** router has received OSMINE certification from Telcordia Technologies, a key requirement for selling to incumbent carriers. OSMINE certification means the router is compliant with operations support systems software that regional Bell operating companies use. These OSSes are too extensive to swap out, so any new gear targeting RBOCs must be made compliant with them. The SmartEdge 800 can be used to aggregate customer traffic onto OC-12 (622M bit/sec) or OC-48 (2.5G bit/sec) trunks in carrier networks. www.redback.com

■ **Tellabs** last week introduced software to help wireless carriers optimize call quality. Tellabs' **3150 Performance Probe** software measures voice signals that route through the Tellabs 3100 Voice-Quality Enhancement system, letting wireless carriers monitor and optimize voice quality in real time, Tellabs says. The software measures and displays speech levels, noise levels, echo and delay every 5 seconds. The software also features an automated measurement function that helps minimize the time to identify and troubleshoot voice-quality performance issues. The software will be available next month. Pricing was not disclosed. www.tellabs.com

Unisphere product juggles protocols

■ BY TIM GREENE

WESTFORD, MASS. — Unisphere Networks will introduce an edge switch-router for service providers that can talk to IP, Multi-protocol Label Switching and ATM networks, and also add service intelligence to the traffic.

Service providers can use the device to gather traffic from customer sites and switch it through to these backbone networks.

"This is for a service provider riding IP on an ATM network who is looking for a way not to expand the ATM network any further and to migrate to IP," says Frank Dzubeck, president of Communication Network Architects and a *Network World* columnist.

Unisphere's MRX can switch among these protocols and map service qualities from one to another. So an ATM virtual circuit could be mapped to the appropriate MPLS path to maintain the appropriate quality of service. Competitors such as Cisco, Juniper Networks and Marconi lack integrated native ATM switching in their edge routers, says Tracey Vanik, an analyst with RHK.

Unisphere says the MRX can save providers money not only by protecting the usefulness of their existing networks, but by combining into one device the functions of several others, including a router, a multiservice switch and an IP services switch.

The MRX supports gigabit Ethernet ports and high-speed optical ports that can be software configured to carry a variety of traffic types.

The switch-router can be used to support MPLS VPN services and virtual LAN services, including multicasting that could support pay-per-view-type services, Unisphere says.

Unisphere makes three different SONET line cards for the MRX: a 32-port OC-3 card; an eight-port OC-12 card; and a two-port OC-48 card. Each can be programmed to support IP over SONET or ATM over SONET.

Each physical port can be carved into

See Unisphere, page 38

Unisphere's MRX

The device combines the functions of an edge router, multiservice switch and IP services switch.

- Native switching of IP, MPLS and ATM.
- Hardware modules can be software-configured to handle IP, ATM or both simultaneously.
- Supports services including VPNs and virtual LANs.

Laurel releases provisioning system

■ BY JIM DUFFY

PITTSBURGH — Edge router start-up Laurel Networks last week unveiled software for provisioning IP and Multi-protocol Label Switching-based services in networks using the company's equipment.

The Laurel Provisioning System (LPS) runs on any high-performance server. It lets network operators configure Laurel's ST200 router, define services to be transported through MPLS tunnels and provision the services via point-and-click commands.

Laurel says LPS is one of the first in the industry to support provisioning of Layer 2 services — such as ATM, frame relay and Ethernet private line — through an MPLS-enabled IP backbone. While the core of service provider networks and revenue-generating services are expected to be IP/MPLS-based over time, providers still make their money from ATM and frame relay.

"It's a repurposing of the Layer 3 network to deliver Layer 2 services that providers are comfortable with, and that there's high margin in," says Dave Passmore, research director at The Burton Group. "[Interexchange carriers] are looking to eliminate overlay networks, but they need to continue to deliver profitable services at the edge."

The converse is a service provider such as AT&T that uses a Layer 2 frame relay or ATM infrastructure to provision MPLS-based IP services. AT&T would not be a target for LPS because the product is designed for Layer 3 IP backbones, not Layer 2 ATM or frame backbones that are IP/MPLS-enabled.

LPS includes client and server components. The Java-based server software runs on Windows 2000, Linux and Sun Solaris 8 platforms, and has three components: the LPS Server, Database Server and Accounting Server.

The LPS Server provides event handling, network discovery and provisioning. The Database Server stores device model, configuration and security information, and historical alarms.

The Accounting Server gathers processes and stores statistical information required to generate accounting, billing and service-level agreement (SLA) management information. SLA data such as resource utilization, reliability, latency and loss are stored here.

The client's Java-based graphical user interface (GUI) lets the service provider configure and manage the ST200 routers, and defines and provisions services. This GUI shows three views of the ST200 environment: an explorer view that shows an icon tree of ST200 domains or customers; a topological view of the network; and an alarm view that shows the status of the ST200 network in color codes, and keeps audit and error logs.

The service providers' enterprise customer has Web client access into the service network to monitor activity and performance against SLAs, and request upgrades or downgrades.

LPS also features a command-line interface for configuring the ST200 routers.

Depending on which server hardware platform it runs on, one LPS can support about 100 ST200 routers, says Steve Vogelsang, a Laurel vice president and co-founder. The server communicates with the routers via a Common Object Request Broker Architecture (CORBA) API, which supports large transactions for configuring or provisioning services on multiple ST200 routers, Vogelsang says.

The software also supports clustering, which lets it scale and provide redundancy, Vogelsang says. Multiple copies can run in sync on multiple servers for management of larger networks and for backup in case of failures.

For operation support system integration, LPS features Java and XML APIs, in addition to CORBA. It also supports SNMP as the interface to third-party element management systems, but does not use SNMP to manage the ST200 environment.

Analyst Passmore says Laurel has a competitive advantage in LPS over edge router companies Cisco, Juniper Networks and Unisphere Networks. However, that edge will be short-lived, and it may not be enough to sway carriers away from the more established vendors.

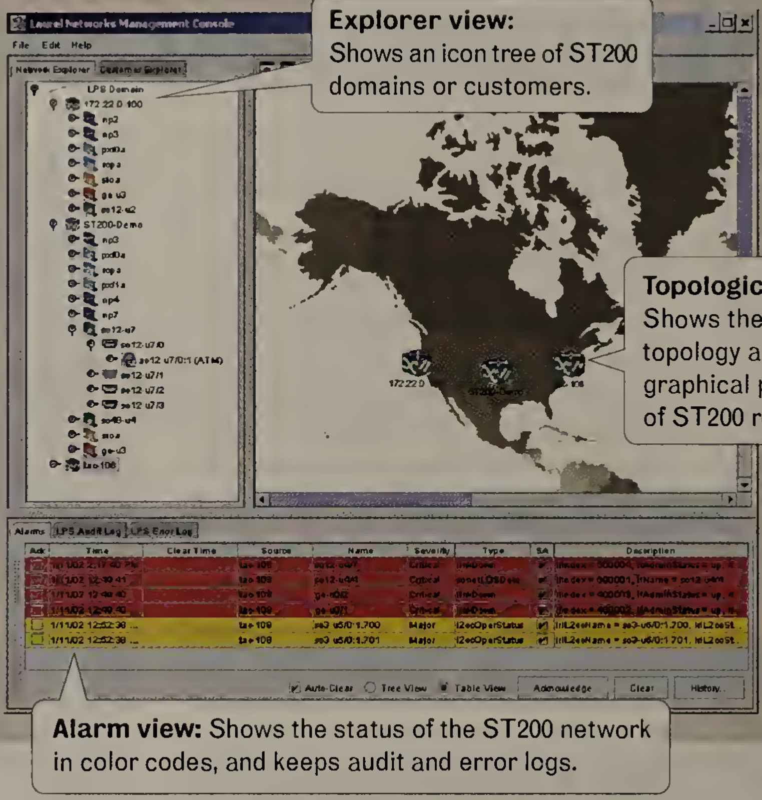
"But Laurel is the first to offer ease of provisioning of Layer 2 services over MPLS," he says.

LPS is available, as is Laurel's ST200 router. Laurel would not disclose pricing for LPS, nor customers for that and the ST200.

Laurel: www.laurelnetworks.com

Bird's-eye view

Features of the graphical user interface to Laurel's provisioning system:



Explorer view: Shows an icon tree of ST200 domains or customers.

Topological view: Shows the network topology and geographical position of ST200 routers.

Alarm view: Shows the status of the ST200 network in color codes, and keeps audit and error logs.

Darwin

continued from page 37

posal uses a management algorithm that only adjusts network performance when congestion starts. The Alladin proposal uses what Hawkins calls an "avoidance method," which is a more passive means of network monitoring.

Raj Sharma, director of technology strategy for optical network equipment maker Luminous Networks, says Darwin's bandwidth management mechanisms let carriers offer and enforce different qualities of service.

The Darwin proposal incorporates two separate means for protection against network failure called wrapping and steering.

The wrapping method, which is required under the proposal, occurs when two links on a ring become aware that a neighboring link is failing and then "wrap" the traffic around the failed link unbeknownst to the other links on the ring.

Steering, which is optional, happens when all nodes on a ring detect failure and involves injecting packets into the ring that are then routed around the failure.

Jeff Baher, a Cisco senior marketing manager, says that both methods of protection can restore the network in 50 msec, like the current, industry-accepted SONET recovery times.

"There is just a lot of religion and philosophy around both methods, and Darwin allows the vendor to select which type of box he wants to have in his network," he says.

Sharma says the two protection methods also allow for backward compliance and simple implementation.

Work on Darwin began in July when several working group members saw the need to merge two different worlds of thought.

"The first step was to get the two gorillas to shake hands," Sharma says. "We needed to work this out and come together. There is a real business issue here, and Darwin has taken the vision of RPR and reaffirmed it."

Gandalf is based on a controversial Cisco-based technology called Spatial Reuse Protocol (SRP). In past meetings, backers of Nortel's Alladin proposal argued that Gandalf didn't provide any traffic management capabilities, but Cisco argued the technology uses a fairness scheme to divide the ring's bandwidth among nodes. Alladin supporters also argued that Cisco was dragging its feet to make its technology the de facto standard.

Cisco responded that Alladin supporters were unwilling to compromise.■

More online!

Find out why time may be running out for an emerging standard for metropolitan Ethernet.

DocFinder: 7839

Unisphere

continued from page 37

channels as small as OC-3 (155M bit/sec), and each channel can be programmed to support IP or ATM over SONET. So a single port on a two-port OC-48 (2.5G bit/sec) card could carry an OC-12 (622M bit/sec) ATM channel, an OC-12 IP channel, an OC-12 broken down into two ATM and two OC-3 IP channels, and an OC-12 into one IP and three OC-3 ATM channels.

Competitor Agere Systems can configure ports with software, but not to mix traffic on one port, Vanik says.

Each card carries the processing power it needs to handle its own interfaces, so users don't have to pay for all of the processing power up front. The MRX chassis has 16 slots and supports from 40G to 320G bit/sec if two chassis are linked within a rack. Dzubeck says this gives the MRX more switching than Lucent's dedicated ATM switches.

Unisphere takes advantage of its router technology developed for its smaller edge router, the ERX, which lacked native ATM switching.

The MRX costs $115,000 for the chassis and software. Line cards cost extra.■

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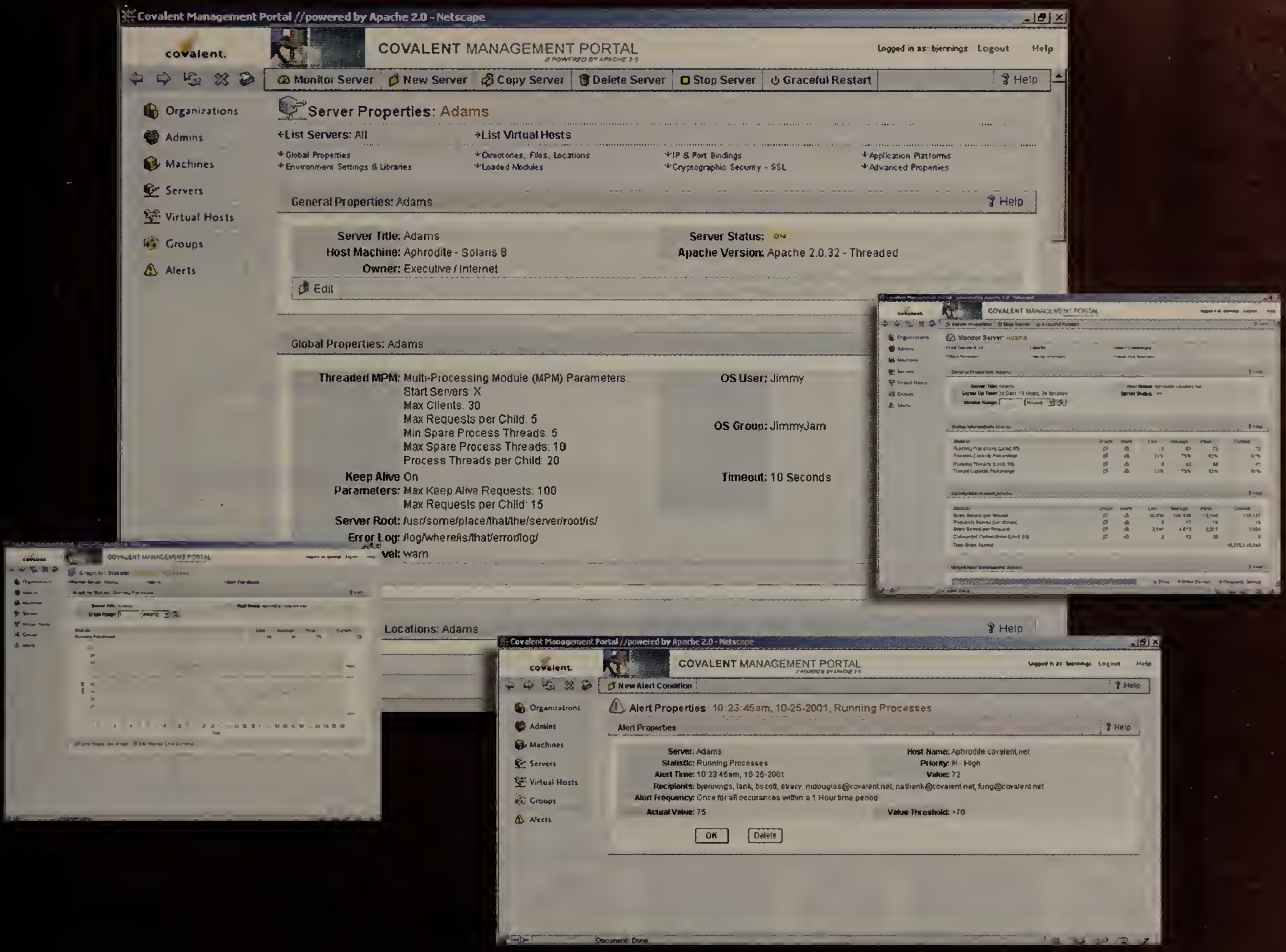

Server Properties: Adams

General Properties: Adams

Server Title: Adams
Host Machine: Aphrodite - Solaris 8
Owner: Executive / Internet
Server Status: ON
Apache Version: Apache 2.0.32 - Threaded

Global Properties: Adams

Threaded MPM: Multi-Processing Module (MPM) Parameters:
Start Servers X
Max Clients 30
Max Requests per Child 5
Min Spare Process Threads 5
Max Spare Process Threads 10
Process Threads per Child 20
OS User: Jimmy
OS Group: JimmyJam
Timeout: 10 Seconds
Keep Alive: On
Parameters: Max Keep Alive Requests: 100
Max Requests per Child 15
Server Root: /usr/some/place/that/the/server/root/is/
Error Log: /log/where/is/that/error/log/
vel: warn

Alert Properties 10:23:45am, 10-25-2001, Running Processes

Alert Properties

Server: Adams
Host Name: Aphrodite.covalent.net
Statistic: Running Processes
Priority: ‼ - High
Alert Time: 10:23:45am, 10-25-2001
Value: 72
Recipients: bjennings, lank, bscott, stracy, mdouglas@covalent.net, nathank@covalent.net, fung@covalent.net
Alert Frequency: Once for all occurances within a 1 Hour time period
Actual Value: 75
Value Threshold: >70

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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

Media converters bridge fiber gap

■ BY DEREK JOHNSON

The idea that upgrading a network to fiber requires tearing out the existing copper infrastructure is a misconception. And it keeps many companies from switching to fiber.

Media converters, which change signals on a copper cable to signals that run on fiber, let a company introduce fiber in the network without making other changes.

Because of this capability, network executives who need to upgrade their systems from copper to fiber but don't have the budget, manpower or time, can turn to media converters.

Media converters, a proven solution for LANs, are playing a role in facilitating the optical last-mile connection to the metropolitan-area network (MAN) and beyond.

As service providers race to deliver fiber-based services to businesses, the major challenge is that 80% of the wiring of today's LANs continue to be copper, while the physical layer infrastructure of MAN and WAN is always fiber. The migration of Ethernet and other protocols from the LAN to the MAN and WAN requires that copper and fiber coexist. Media converters can help ease that transition.

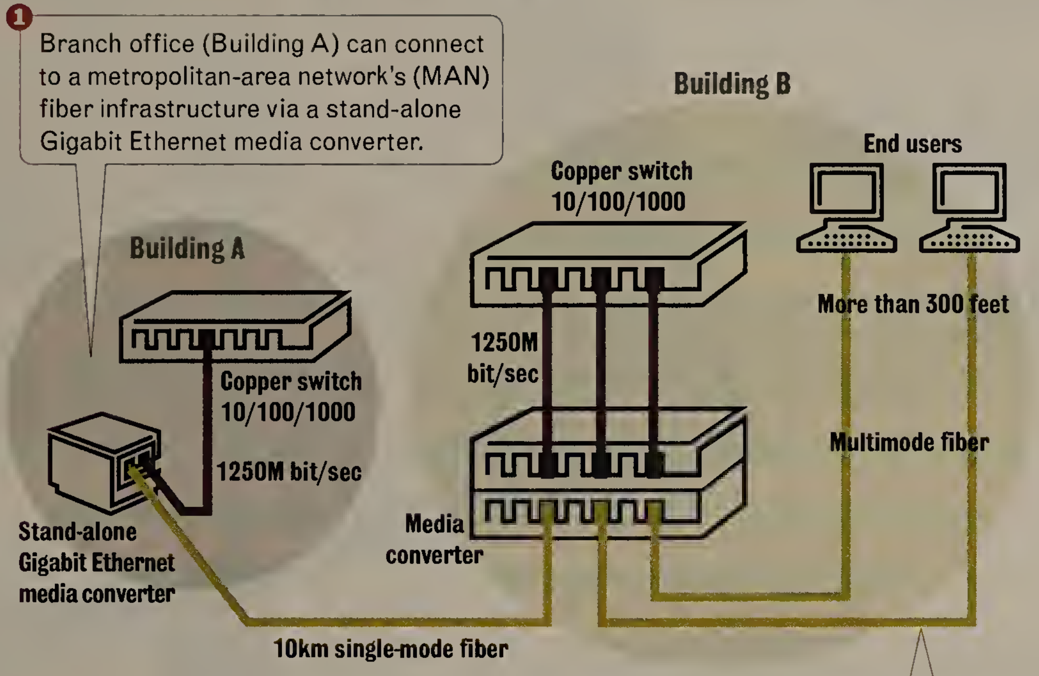
Media converters work on the physical layer of the network. They receive data signals from one media and convert them to another while remaining invisible to data traffic and other net devices. They make one cable "look" like another cable without changing the nature of the network.

In its simplest form, a media converter is a small device with two media-dependent interfaces and a power supply. It can be installed almost anywhere in a network.

■ HOW IT WORKS

Media converters

Media converters provide a simple way to introduce fiber into a LAN without having to tear out the existing copper wiring or make changes to copper-based switches.



① Branch office (Building A) can connect to a metropolitan-area network's (MAN) fiber infrastructure via a stand-alone Gigabit Ethernet media converter.

② Because Gigabit Ethernet over copper can only extend for about 300 feet, Gigabit Ethernet links beyond that distance require fiber. A media converter takes traffic being carried on copper cables from a copper-based switch and converts it to optical signals that can be carried on multimode fiber to end users.

The style of connector depends on the selection of media to be converted by the unit. In a Fast Ethernet environment, a 100Base-TX to 100Base-FX Media Converter connects a 100Base-TX twisted-pair device to a 100Base-FX compliant single or multimode fiber port that has a fiber-optic connector. In a Gigabit Ethernet, a media converter commonly is deployed to convert multimode to single-mode fiber.

Media converters are as simple to install as patch cables and connectors. Media converters function as physical layer devices; they do not interfere with upper-level protocol information. This lets them support quality of service and Layer 3 switching.

For densely populated installs, up to 16 or more devices can be rack-mounted in chassis-style devices. These chassis-style products can be managed with SNMP so that the media converter becomes just another element in the network diagram — not a black hole.

Media converters were designed to be implemented in Ethernet networks and some ATM applications.

Because media converters are transparent, they do not change speed or duplex mode. Rather, they let the end devices determine the highest common denominator. The speed must be homogenous. Data cannot successfully pass when there is a mismatch of speed and/or duplex mode.

A media converter isn't a bridge or a switch. It doesn't look at addresses or other data. A media converter isn't a repeater and doesn't recognize or react to collisions. It passes bits through one by one.

How do you know if you should use media converters?

- If you need to extend your network's distance beyond copper's limits, you will need to use fiber (Copper is generally limited to about 300 feet).
- All your available device ports are copper, but your cabling is fiber.
- The switch or network interface card (NIC) manufacturers pricing for native fiber is too high.
- The switch or NIC manufacturer does not make your desired fiber configuration.
- You want to connect an old coaxial device (10Base-2) device to a LAN to a twisted-pair network.

Johnson is the strategic accounts manager at IMC Networks. He can be reached at djohnson@imcnetworks.com.

Ask Dr. Internet

By Steve Blass

We're researching whether a consolidated IT department would improve the quality of support compared with our current multiple IT groups. Each office has a LAN support group with its own objectives and budget. There are some company-wide IT goals, such as e-mail software that affects the entire company. We'd like your thoughts on independent departmental IT groups vs. one company IT department, and future trends concerning company IT support.

The issues revolve around business culture rather than technology. Making the argument for centralization will require that you address business issues in business terms and explain why this will put more money in the cash register at the end of the day. It matters more that the teams delivering IT services can communicate and work together effectively than whether IT is centralized. The trend in IT organizational structure seems to be a continuous cycle of centralization and decentralization efforts seeking to balance organizational IT requirements and specific business unit needs. New technologies enter through departments with specific requirements and are supported by departmental IT groups. Mature technologies used by the entire business are supported by central IT.

Blass is a network architect at Change@ Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD
INSIDE THE
NETWORK
MACHINE

Mark Gibbs

A good syncing feeling

Well, this week we were going to take a look at Suitcase Network from Extensis, but we discovered late last week that although the server component runs under Windows NT, the management console only runs on Macintosh. As we don't have a Macintosh here, we are stymied until we can beg, borrow or steal.

So this week we'll look at a product that has made our lives easier — including the problem of distributing sets of fonts to multiple PCs. That product is PCsync from LapLink (www.laplink.com).

PCsync is a utility for moving files around TCP/IP nets and Microsoft LANs. But wait! There's more! Yes folks, not only does it uni- or bidirectionally sync files, but it can migrate the files of some 45 popular applications and their settings from one PC to another.

Before you get too excited about the application migration, realize that it is just the working files and application configuration that are moved — moving complete applications is fiendishly difficult.

We recently tried a product called Alohabob PC Relocator (www.alohabob.com) that attempts to do a complete relocation job, and it was a total failure — the program seemed to choke on the volume of data, and as we'd left it running for several hours we were not inclined to start over. If anyone has used this program, perhaps you could tell us about your experience.

Anyway, PCsync is pretty cool and very easy to install. If the Microsoft Java VM is not already installed, PCsync's installer will install and reboot to complete the process. If you already have the VM, installation is painless, as rebooting isn't needed.

You configure PCsync by telling it what you want to share (assuming that you do) and what privileges you want users to have (read-only or read-write); assign a username and passwords (one for each privilege level); whether only Secure Sockets Layer connections will be allowed; and select whether non-PCsync users should have access (we'll come back to this in a second). PCsync also can send e-mail to alert people that you have content to share.

You can scan for other visible PCsync installations on your network or connect by name (DNS or Microsoft networking) or by IP address. Once connected, you can select files and directories on your side or on the remote machine and transfer them unconditionally. Or you can update either or both ends, optionally excluding files that aren't on both sides and optionally including subdirectories. You can also apply a mask to further constrain which files are affected.

GEARHEAD RATING

9

LapLink PCsync

1=awful, 10=insanely great

A very useful feature, called SmartXchange, gives you the ability to save transfer jobs so they can be run again. You can also selectively exclude files by allowing a preview of the transfer job, and those excluded files can be stored as part of the SmartXchange job. The only things we think are missing from this feature are a timer so that transfers can be scheduled and command-line parameters so that PCsync can be launched and automatically execute a SmartXchange job.

But there's another really, really useful feature: A built-in Web server they call Surf Up (ugh!). By pointing your browser to the DNS name or IP address of an appropriately configured machine running PCsync, requesting Port 8444 and the directory PCsync you can browse, upload and download the shared contents of the remote machine. LapLink also provides a Lightweight Diectory Access Protocol service so that you can find machines easily running PCsync over the Internet.

PCsync comes with a serial cable, or you can use a Universal Serial Bus connection for direct local connections. LapLink wisely has included the ability to download PCsync to another machine over the serial connection, but unwisely not over a network connection, which would be jolly useful. Be that as it may …

LapLink also includes a variant of PCsync called MusicMover that can find, play, copy and move MP3 files to and from libraries you set up. And PCsync is smart enough to be able to read the MP3 tags and sort by any of the fields available. It even can analyze the files to display pie graphs showing how your library is divided by genre or artist.

At $80, PCsync is a nice piece of work and we award it nine gearteeth out of 10.

Transfer your comments (and Macs) to gearhead@gibbs.com.

Cool Tools

A roundup of the latest neat stuff

Keith Shaw

ChemBook notebook includes biometrics fingerprint sensor

Chem USA has announced its ChemBook 8600 series, a laptop that includes a biometric fingerprint sensor, dual hard drive and battery options, and incorporates Intel Mobile Pentium III processors, with speeds up to 1.0 GHz and a 100-MHz system bus. Display options include 15-inch TFT displays, which support XGA resolutions up to 1,024 by 768 pixels with 16.7 million colors.

The fingerprint security feature prevents unauthorized booting up or logging on by requiring a user to place his finger on the device during boot-up. The notebook also features four "instant launch" utility keys — for e-mail, Internet and power-saving, and one for users to define their own applications.

The notebook starts at $1,500. Head to www.chemusa.com for more features and information.

Two cool searching and screen printing tools

SilverLakeTech has two cool products you should take a look at:

Print Screen Works Version 6.0 gives you an easy way to capture and print, e-mail or fax anything that's on the computer screen. In the present Windows form, pressing the "Print Screen" button launches a tedious process of copying, pasting and opening other applications. Print Screen Works 6.0 sits in your system tray and converts the Print Screen button into a hot key, which triggers the capture process.

Once you capture an image (and you can capture the whole or just parts of the screen), you can save it as a .bmp or .jpg file. The software costs $30, and site licenses are available. A 15-day trial version is available at www.silverlaketech.com.

PC Data Finder Version 5.5 offers more file-searching flexibility than the Windows Explorer utility. With this software, you can search for keywords, e-mails, Outlook PST, Adobe PDF, ZIP compressed files, HTML files and Office Suite extensions.

Now your computer gives you
SAFE
SECURE ASSETS FOR EVERYONE
the protection that everyone needs.
Kodak
32 MB ThumbDrive Secure
SAFE

Red Queen's SAFE gives you a bonus USB hard drive.

The program can also conduct Boolean, proximity, phrase, wild card and complex queries on the documents in any directory or drive. The software costs $40; site licenses are available. Go to www.silverlaketech.com for more information.

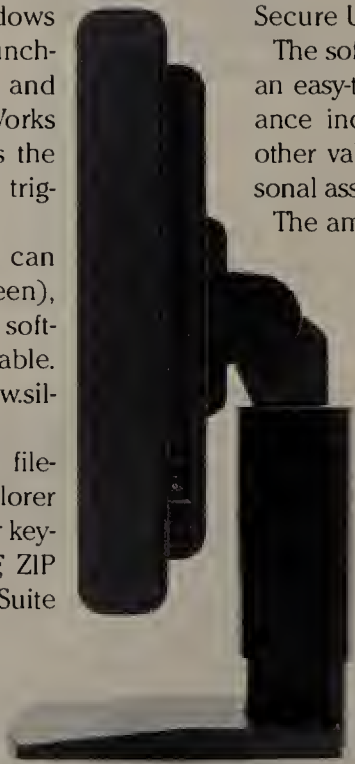
Red Queen marries software and hardware

Red Queen Software has teamed with the makers of the ThumbDrive Secure hard drive to present the SAFE Plus package, which includes Red Queen's SAFE (Secure Assets For Everyone) software and a 32M-byte ThumbDrive Secure Universal Serial Bus hard drive.

The software lets you track all of your belongings in an easy-to-enter format. Originally started as an insurance industry application for logging antiques and other valuables, the software has evolved into a personal asset collection program.

The amazing part of this package is the technology behind the software. SAFE uses an SQL database, Microsoft ADO and DCOM technologies, and Seagate Crystal Reports as a report generator. It includes a built-in browser for cutting and pasting information from company Web sites into the records.

The SAFE Plus package costs $140 and comes with the 32M-byte ThumbDrive Secure to store all your records on the hard drive. Go to www.redqueensoftware.com for more information.



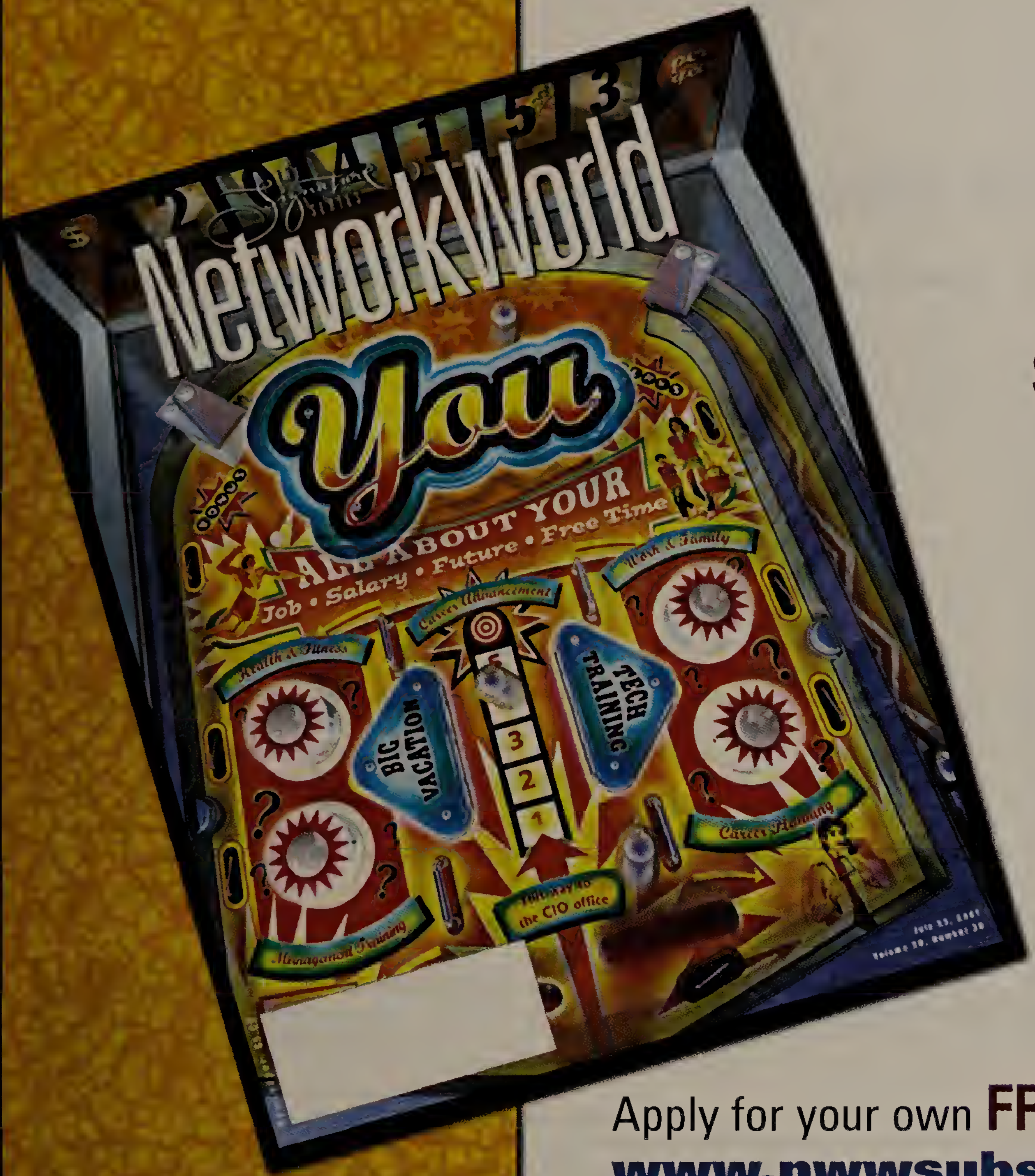
The NEC MultiSync LCD 1850E is only three inches deep.

Get a 17-inch LCD monitor for $800

NEC-Mitsubishi last week announced two large-screen LCD monitors: the 17-inch NEC MultiSync LCD1720M and 18-inch NEC MultiSync LCD1850E, which cost $800 and $900, respectively. The LCD1720M has internal front-firing multimedia speakers built into its 3.4-inch-deep frame and weighs 16.1 pounds with its stand. The 1720M offers an ultrawide viewing angle of 160 degrees horizontally and vertically through NEC's XtraView wide-viewing-angle technology. The 1850E also includes the XtraView technology, measures 3.1 inches deep and weighs 18.7 pounds with its stand.

Both monitors are available now through NEC-Mitsubishi resellers. For more information, go to www.necmitsubishi.com.

Send any Cool Tools info to kshaw@nww.com.



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EDITORIAL

Keith Shaw

Look before you leap into 802.11a

If you are looking to boost the speed of your wireless LAN infrastructure, the arrival of 802.11a wireless Ethernet products that use the 5-GHz frequency range should be a good thing. The products provide about five times the speed of current 802.11b (or Wi-Fi) products, and faster speeds make happier end users, right?

Unfortunately, there are a few bumps in the road, which makes the issue of whether to adopt 802.11a a tricky one (check out page 55 for our first look at a few of the early products in this market).

First off, most of the top 802.11b vendors are not yet producing 802.11a products. Vendors such as Cisco, Agere Systems (Orinoco), Symbol Technologies and Enterasys Networks are waiting a few months before launching so they can add better security and more functionality, and be able to ensure product interoperability.

While many vendors will eventually offer 802.11a products, there's debate about which high-speed wireless LAN protocol will dominate in corporate networks.

The 802.11a products coming out now support speeds up to 54M bit/sec, but the recently approved 802.11g standard promises the same speed and the added bonus of backward compatibility with current 802.11b (and even older 802.11) gear. The 802.11a protocol uses frequencies in the 5-GHz range, while 802.11g uses frequencies in the 2.4-GHz range, the same as 802.11b.

For companies that have spent a lot of money on wireless LANs, waiting another nine to 12 months for 802.11g products might make more sense than ripping up existing infrastructure to install 802.11a gear. Coming in three to four months will be dual A/B access points that let you try out 802.11a while still supporting the 802.11b infrastructure.

But if you want to jump into 802.11a (for example, you don't have an 802.11b network), be wary of a few things. First, product interoperability hasn't been fully tested. The Wireless Ethernet Compatibility Association (WECA) did a great job on certifying 802.11b products with its Wi-Fi program. The new logo program, known as Wi-Fi5, is in the works but won't begin until more chipset vendors launch products.

Second, make sure you understand the market that the vendor is targeting. Currently, only Proxim (which is merging with Western Digital) has an enterprise-level 802.11a product, (Harmony line).

So before you rush to buy the new 802.11a products, make sure you are doing it for the right reasons for your company, as opposed to doing it just because it's the newest and coolest thing.

— Keith Shaw
Senior reviews editor
kshaw@nww.com

opinions!

Support forums

The following letters concern two recent columns on online support forums: "Finding grief instead of answers" by Shari Loback (www.nwfusion.com, DocFinder: 7842) and "Paying attention or lip service?" by Mark Gibbs (www.nwfusion.com, DocFinder: 7843).

I agree with Shari Loback that the Web interface to Novell's new forums leaves a lot to be desired, especially a good search engine. However, Novell's preferred (and stated) method for users to access its forums is via [Network News Transport Protocol] with a news client. That way, users are free to use the client and search options of their choice. Should you still need to use a browser to access the forums, you can get a solid search done by going to http://groups.google.com.

Terry Rodecker
Novell Support Connection Volunteer SysOp
Oklahoma City

I'm one of the poor volunteer Novell Forum systems operators that don't answer questions in a timely manner, according to Shari Loback. Strangely enough, the majority of customer reaction to our support forums is very positive. But our customers seem to be able to use a full-featured NNTP newsreader, which is the access method of choice to support-forums.novell.com as stated at http://support.novell.com/forums/.

In general, support forums leave a lot to be desired. This is not true for Novell's support forum, and thousands of satisfied customers will agree.

Massimo Rosen
Novell Support Connection Volunteer SysOp
Cologne, Germany

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

Shari Loback's column on online support is a door opener to an even worse problem: the decline of value in paid-for support.

If you have a support contract and, like a good user, search the support Web pages before calling someone, why is it that the first words out of their mouths are, "Look at the support pages"? Why is it that if you call three times with the same question, you can get not only three different answers, but conflicting ones? Free support forums are not the only ones becoming less and less useful.

Catherine Button
Network administrator
Panasonic AVC American Labs
Westampton, N.J.

Although in general I agree with Mark Gibbs' observations about online technical support, there are a few vendors that stand out in this area. Oracle's support forums are excellent, monitored by gurus and the vendor's support personnel. Even better, the discussion threads become part of the searchable knowledgebase.

John Woodrum
Atlanta

I use Novell support forums on a regular basis. I cannot count the number of times I have had a problem resolved quickly and correctly by other Novell users and systems operators. I have also used the Intel support forums to solve issues. On the other hand, Microsoft's forums are useless as well as being fraught with spammers.

Mark Gibbs' comments on vendors' e-mail technical support services is right on target. I have never experienced any of these that do anything except provide stock responses.

Dave Mackler
MIS administrator
Mesa Developmental Services
Grand Junction, Colo.

More online! www.nwfusion.com Find out what readers are saying about these and other topics. **DocFinder: 7825**

MikeKeefe2002
YOU DON'T SUPPOSE THIS IS ONE OF THOSE OLYMPIC "WEB SERVICES" WE'VE BEEN HEARING ABOUT?
THWANG

ON THE ROAD

Dennis Drogseth

Investing in the right mgmt. tools

Deciding which management tools to buy is a struggle for many companies. The categories used to be simpler. If you bought a reporting product, you expected to also invest in one with SNMP trap management. Just a few ago, rudimentary performance and fault management didn't have much in common. The management arena was made up of clearly defined markets separated by wastelands of unanswered requirements.

NetworkWorld
On the road with
SEMINARS & EVENTS

This is changing. The good news is the selection of management products is richer and much better. The bad news is the market is confusing and product marketing is, inadvertently or not, misleading.

One of the areas of greatest improvement — and confusion — concerns availability and performance management, sometimes called "service assurance." Availability management involves diagnosing and fixing problems quickly to minimize downtime. Performance management addresses more subtle trends that affect performance and response time, as well as issues involving capacity and infrastructure optimization. From Feb. 6 to Feb. 13, I'll be hosting a *Network World* seminar in four cities (San Jose, Denver, Washington, D.C., and New York) on how to select the best availability and performance management tool for your company.

Advanced availability management products not only significantly reduce the volume of red lights, but can isolate the point of failure with reasonable accuracy (according to my company's research, more than 75% of the time). Meanwhile, performance management products have evolved to offer more detail about service levels, business impact and real-time information.

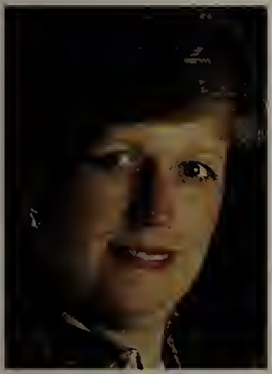
The availability and performance management arenas are beginning to converge. Availability management vendors are no longer content to identify faults once they occur — they proactively want to prevent downtime. This requires thresholding and other basic, performance management capabilities. At the same time, performance management vendors are integrating into their products technologies associated with fault management, including event management and alarm reduction.

Given this trend, what should you do? Will a single product to do it all? Are today's products really just the old reporting and trap-management gear on steroids?

The seminar I'm hosting will examine these questions as four leading vendors — Hewlett-Packard, Concord Communications, Tavve Software and NetQoS — present their views on the topic, with insights into their products. (To register, go to www.nwfusion.com, DocFinder: 7830.) Even if you can't attend, send me your thoughts on addressing this evolving and challenging purchasing decision.

Drogseth is a director at Enterprise Management Associates, an analyst and market research firm focused on management software and services. He can be reached at drogseth@enteprisemanagement.com.

Are today's products really just the old reporting and trap-management gear on steroids?



SPEAKING THE LANGUAGE

Linda Musthaler

The Holy Grail of single sign-on

During my 20-plus years in the IT industry, single sign-on has been the Holy Grail for people who use multiple disparate systems and applications. There are separate passwords for the PC, the mainframe, the accounting application and the sales-tracking application. Because I'm the same person, you'd think I'd only have to sign on once and my identity could be passed among them.

The epic march toward global authentication takes on new meaning when we look at the Web and all the places there where you have to confirm your identity. It will only get more complex when Web services take root in the coming years.

Several companies and consortia are tackling the problem of Internet identity management. All hope to be the first to the finish line for worldwide adoption, as the winner gets to define a very important set of standards. The major players in this arena are Microsoft, with its Passport authentication scheme; The Liberty Alliance Project, a consortium of several numerous technology and business players that advocate an open standard; and AOL Time Warner, with its Magic Carpet. As you might expect, none of the solutions are compatible.

In this latest "space race," the major issue is the planned scheme for storing and managing identity information. Should one company hold all the identity information? Should it be a third-party, federated solution? If multiple sources hold the identity database, how would they interact?

When I recently wrote about Internet authentication for *Network World's* Technical Executive Newsletter (see www.nwfusion.com, DocFinder: 7829), I found people are very passionate about the problem. Obviously, this is a technology in development that is well worth watching. Network managers will want to know who is authorized to use their networks and how. Application developers will need to know which standards to support and the APIs to which to write. End users will want to know how and by whom their personal information is being used.

The concept of single sign-on is noble. But the road to this nirvana is riddled with potholes.

For one thing, privacy groups grow alarmed when they think about your identity information (including credit card numbers and Social Security number) passing from site to site without your intervention. Although safeguards would protect and limit what data is transferred, safeguards can be circumvented. This is true no matter which of the three authentication schemes ultimately wins the war. As if to reaffirm this concern, hackers have already broken into the Passport Internet Authentication service, shutting it down for two days recently.

Who keeps the identity database is a key issue. Currently, Microsoft keeps a centralized database with the Passport identity information. Critics are fearful Microsoft may use the collected information for marketing or other selfish purposes. It appears the company may bow to pressure from critics who want a neutral third party to hold the database.

For its part, The Liberty Alliance Project already has said it would use a multiparty federated database. The group likens it to our nationwide credit card system, where there are essentially two clearinghouses that determine if a charge should go through or not. Having an impartial entity hold the data is essential to boost the confidence of privacy advocates.

The Liberty Alliance Project intrigues me. The group has a daunting task as it tries to develop an all-encompassing, yet neutral, technology and policy solution. Yet, looking at the players committed to this project (Sun, American Express, AOL Time Warner, Bank of America, Dun & Bradstreet and United Airlines, among others), I have to think broad acceptance of whatever solution the coalition develops is a given.

I believe we'll end up with both Passport and the Liberty Alliance Project as our "standards" some day, and systems integrators will get rich trying to make them work together. Better bone up on your programming skills.

Musthaler is vice president of Currid & Company, a Houston technology consulting firm. She can be reached at linda@currid.com.

The concept of single sign-on is a noble one. But the road to this nirvana is paved with potholes.

Miercom Interoperability Testing Labs

VoIP

Advanced features gain support and first H.323 to SIP

BY BETSY YOCOM,
KENNETH PERCY,
MARC FRIGO AND
KEITH DAMA,
NETWORK WORLD
GLOBAL TEST ALLIANCE

Our latest round of interoperability tests shows that voice-over-IP products, which could only work together at basic levels last year, can now support advanced telephony features like call holding and call transferring. And in the first public test of products supporting competing voice-over-IP specifications, H.323 to Session Initiation Protocol internetworking was successfully demonstrated. This will let users with embedded H.323-based voice-over-IP equipment more easily roll out enhanced services, such as real-time messaging, that other protocols allow.

We've carefully documented voice-over-IP interoperability over the past 18 months (see www.nwfusion.com, DocFinders: 7822 and 7823) because having point products work together end to end is the only way enterprise customers can use them as a replacement to existing telephone systems.

In this round, we invited vendors with products based on the International Telecommunications Union's H.323 and/or the IETF's SIP, challenging them to prove interoperability based on the same protocol but also between H.323 and SIP.

Seven vendors answered the call — Avaya, Cisco, Dynamicsoft, Mediatrix, Pingtel, Quintum and Siemens ICN — with a total 14 products. Siemens, Dynamicsoft and Cisco ventured into the H.323-to-SIP internetworking arena with successful results (see www.nwfusion.com, DocFinder: 7821).

During the interoperability tests, we used Agilent Technologies' Agilent Advisor Version12.0, running IP Telephony Analyzer software, to help identify coding problems that frustrated interoperability.

On the H.323 side

Although Versions 3 and 4 of the ITU's H.323 umbrella specification have been available for more than a year, vendors tested with H.323 Version 2 because they were more comfortable with it.

Vendors testing H.323-based products didn't have serious problems interoperating at basic levels, but getting gatekeepers — complex, high-level call-control hardware and software combinations necessary for interdomain communications — to work together was still not ubiquitous.

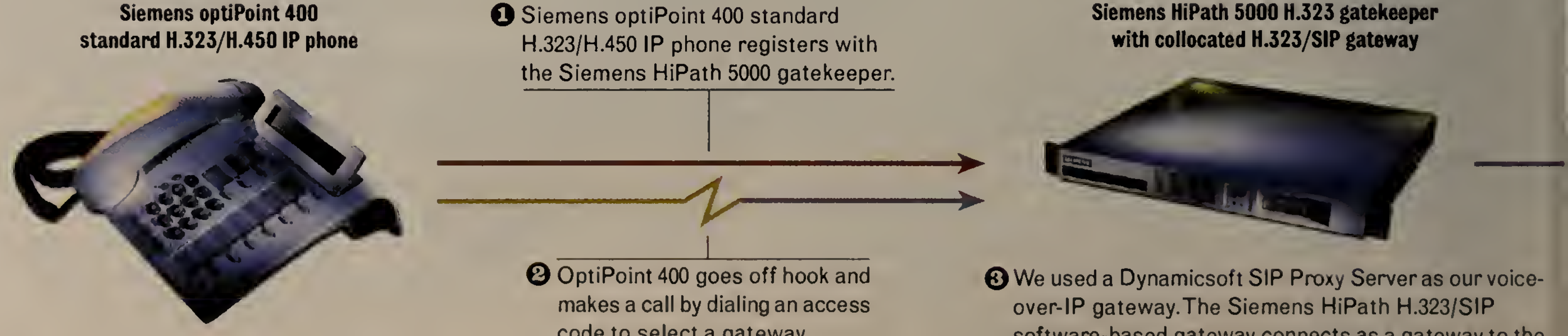
In our tests a year ago, gatekeeper interoperability was almost unheard of because while these products may be standards-based, vendors have their own, often subtle, differences in implementing the H.323 spec that prevent interoperability.

This year, the Quintum Tenor gatekeeper and the Avaya IP600 gatekeeper worked with each other but neither could interoperate with the Siemens HiPath 5000 gatekeeper. We discovered that unless each gatekeeper supports one particular protocol feature — the H.323 Location Request/Location Confirmation (LRQ/LCF) message — they couldn't interoperate. Siemens tested its gatekeeper with a product release that did not support LRQ/LCF but says it plans to support LRQ/LCF in its next release.

Codec negotiation, a stumbling block last year, was a nonissue.

Proving H.323 – SIP interoperability

Miercom tests show hope for the two voice-over-IP standards working together on the same network.


Siemens optiPoint 400 standard H.323/H.450 IP phone
Siemens HiPath 5000 H.323 gatekeeper with collocated H.323/SIP gateway

❶ Siemens optiPoint 400 standard H.323/H.450 IP phone registers with the Siemens HiPath 5000 gatekeeper.

❷ OptiPoint 400 goes off hook and makes a call by dialing an access code to select a gateway.

❸ We used a Dynamicsoft SIP Proxy Server as our voice-over-IP gateway. The Siemens HiPath H.323/SIP software-based gateway connects as a gateway to the Siemens HiPath 5000 H.323 gatekeeper and to the Dynamicsoft SIP Proxy Server over an IP link.

interoperability makes strides

interconnections demonstrated, but more work needs to be done.

Advanced H.323 features

An important aspect of voice-over-IP interoperability is the delivery of features to IP phones. Previously, we've seen little support for the H.450 standard, a spec defined under the H.323 umbrella that details a rudimentary set of telephony features, such as call forwarding and call hold.

This time around, Siemens and Mediatrix demonstrated interoperability of numerous H.450-based services: call hold, call transfer, call busy, forward on hold, forward on busy and forward always. The Siemens products also support message waiting, but Mediatrix did not. The fact that Siemens and Mediatrix have a collaborative business partnership undoubtedly influenced their interoperability success.

With one notable exception in our group, H.323-supporting vendors have not been very aggressive in implementing the H.225 security standards, which also falls under the H.323 umbrella spec. Avaya provided a customized version of its IP600 IP PBX for the interoperability test bed, in which its inherent authentication feature — one security component under H.225 — was disabled. Avaya did so to interoperate with other H.323-based products on a wider set of overall features.

Implementation of the T.38 spec for faxing over an IP-based network — another spec defines under the H.323 standard — was nowhere to be seen in this latest round of interoperability testing. This isn't surprising because use of traditional fax machines is diminishing overall.

Mediatrix, Avaya and Quintum successfully demonstrated dynamic fax detection with various codecs and showed that they could automatically return to a normal voice path once the fax transmission was completed. But interdomain faxing between disparate voice-over-IP gatekeepers, the environment where T.38 applies, remains an open issue.

Quintum was the only vendor that successfully demonstrated tunneling based on H.245, which was verified by packet traces done on the Agilent Advisor test tool. H.245 defines tunneling as an H.323-based feature that conserves logical ports. This is appealing to service providers and carriers, but difficult to implement.

The setup of dialing plans, which is not specifically an H.323 issue, continues to frustrate basic interoperability. Vendors have different design philosophies in how they implement dialing plans because of ambiguities in the Q.931 specification (which addresses signaling in the H.323 network). This ambiguity clearly affects vendors' ability to interoperate out of the box.

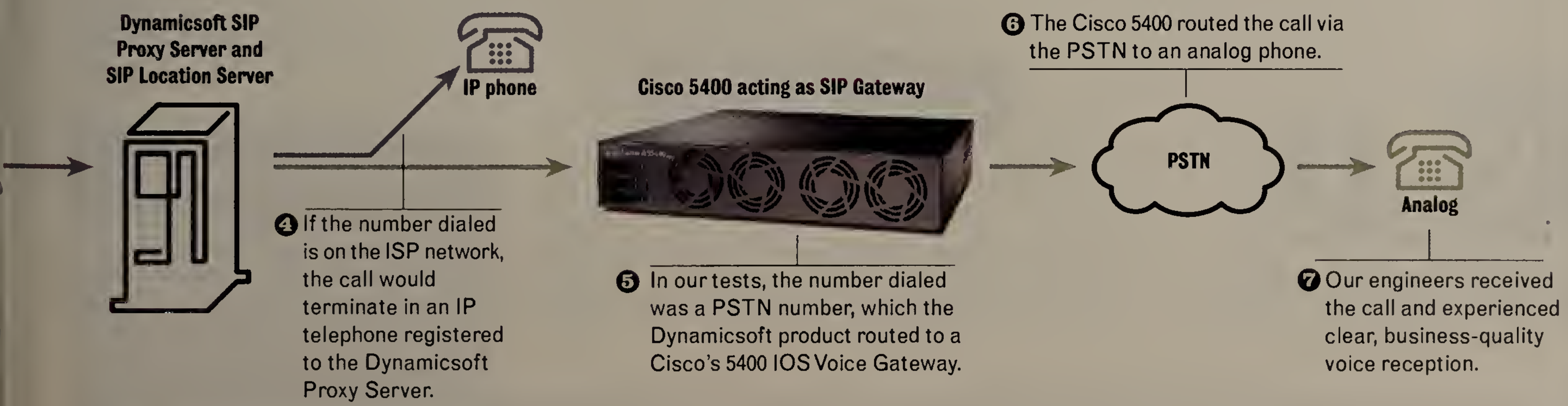
Quintum's gatekeeper looks for a dialed number when setting up a call, while Siemens' gatekeeper lets its end points handle Q.931 signaling and instead looks for source and destination IP addresses to set up a call. So while the Siemens optiPoint phones could register with the Quintum gatekeeper, the reverse didn't work as well. Dialing plan issues also frustrated Mediatrix's ability to achieve out-of-the-box interoperability. Mediatrix products expect to see five-digit numbers, while other products expect seven-digit numbers. Once these issues were resolved with software patches, basic call set up and completion quickly occurred. But issues of this nature can be time-consuming to analyze and fix.

On the SIP side

We took Cisco 7960 IP phones with SIP loads through their paces against our SIP reference test bed, consisting of the Dynamicsoft SIP Proxy Server and SIP Location Server (the latter registers SIP users on the network) and Pingtel xpressa IP phones. The Cisco phones sailed through basic and advanced tests without incident, highlighted by a four-way conference call with two Pingtel xpressa phones and two Cisco 7960 phones, all registered to the same Dynamicsoft SIP Proxy Server.

We asked several vendors that we believed were either developing or shipping H.323/SIP gateway products to participate in this aspect of the interoperability testing. Only Siemens was willing to go on the record with its H.323/SIP Interworking Gateway.

Siemens' gateway is collocated on the same machine with the Siemens HiPath 5000 gatekeeper. A Siemens optiPoint 400 phone registered on Siemens' gatekeeper successfully placed a call to an analog phone on our simulated public switched telephone network via the


Dynamicsoft SIP Proxy Server and SIP Location Server
IP phone
Cisco 5400 acting as SIP Gateway
PSTN
Analog

④ If the number dialed is on the ISP network, the call would terminate in an IP telephone registered to the Dynamicsoft Proxy Server.

⑤ In our tests, the number dialed was a PSTN number, which the Dynamicsoft product routed to a Cisco's 5400 IOS Voice Gateway.

⑥ The Cisco 5400 routed the call via the PSTN to an analog phone.

⑦ Our engineers received the call and experienced clear, business-quality voice reception.

Test drive of Windows Messenger v4.6 upgrade

Microsoft released Messenger 4.6 — an embedded Session Initiation Protocol stack in Windows XP that lets PCs work as a soft phone on a voice-over-IP network — just as our interoperability testing was wrapping up last month. We gave it a run in our Dynamicsoft/Pingtel SIP test-bed infrastructure.

We installed XP Professional on a Compaq Deskpro EN PC with one GHz Pentium III processor and 256M bytes of RAM. After Windows Messenger 4.6 was downloaded and installed, we registered the stand-alone client with the Dynamicsoft SIP Proxy Server and placed calls from Messenger to the Pingtel xpressa IP phone, and vice versa. Voice communications on the Messenger soft phone was clearly business-quality.

While this impromptu first look at this feature is by no means definitive, it appears that Messenger 4.6 is a successful voice-over-IP implementation, and the implications could be far-reaching.

As consumers — to whom Messenger is targeted — get used to voice-over-IP applications and begin demanding them, Microsoft's presence could put voice-over-IP on a trajectory toward exponential growth. Consequently, this could be a [illegible] SIP as [illegible] protocol of [illegible]

— [illegible]

Tests demonstrate interoperability between voice-over-IP standards.

Dynamicsoft SIP Proxy Server and Cisco's 5400 SIP-based IOS Voice Gateway. Voice quality was excellent.

This test constitutes a small first step, but a significant portent of things to come. Efficient H.323-SIP conversion is an important step on the path to ubiquitous voice-over-IP interoperability, holding the promise of extending SIP-based services and applications common in the carrier space and applications to existing H.323 networks common in enterprise deployments. SIP is maturing to the point where it's delivering on services, such as real-time messaging and "follow-me" applications, which are attracting more widespread use.

The downside to H.323-SIP internetworking is that H.323 and SIP are vastly different protocols, and interoperation is difficult. A recent IETF draft specifically addresses SIP-H.323 internetworking. (For details, go to www.softarmor.com/sipping/drafts.) This lengthy (124-page) document begs the question: Do we want SIP to do more than originally intended? The answer appears to be yes, but this necessarily adds to its complexity.

Jonathan Rosenberg, chief scientist at Dynamicsoft and co-developer of SIP, says it is a common misconception that SIP and H.323 can be internetworked perfectly. While basic phone calls and some simple features will internetwork — because they are common to both protocols — more advanced features, such as integrating e-mail and Web services into voice/video, won't.

www.nwfusion.com

More online!

- Get a full listing of products tested for Interop.
- Check out the matrix showing how H.323 products worked together.

DocFinder: 7831

What's next

Voice-over-IP products continue to mature, and vendors are taking interoperability among H.323 and SIP products more seriously as the demand for voice-over-IP-enabled services, such as real-time messaging and follow-me applications, increases. Many leading vendors, such as Cisco and Siemens, already incorporate both H.323 and SIP in their products, and others are working on them.

This year, look for increasing internetworking between H.323 and SIP products as greater acceptance of voice-over-IP among consumers fuels demand in the workplace, and generally greater acceptance of voice over IP among consumers.

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NEC Express5800 server

You can get 99.999% uptime at commodity prices.

■ **BY JOHN BASS, NETWORK WORLD GLOBAL TEST ALLIANCE**

Getting 99.999% uptime for servers is difficult. The classic five 9s means a server can only be down for 5 minutes or less for the entire year.

There are servers that can do this, but typically you have to pay a steep price ($200,000 or more for proprietary solutions). NEC offers a server with off-the-shelf Pentium III processors that promises 99.999% uptime for about one-tenth the price (around $20,000). We tested the NEC Express5800/320La and found it a fantastic minimal downtime server, if you're willing to trade off some performance for the commodity price.

The NEC Express5800/320La offers a great price for redundant hardware.

Clustering vs. redundant

High-availability server systems come in two categories: server clustering and hardware redundant servers.

Server clustering uses inexpensive commodity servers that communicate with each other to determine when a server in the cluster is down. When a failure is detected, the standby servers pick up the load.

The switch times during failure tend to take a while because the cluster management mechanism has to determine that a failure has occurred, notify the standby server, and then let the standby server take over.

The second category, hardware redundant servers, contains fully redundant components that can be hot-swapped when a component fails. Each standby component stays synchronized with the active components to minimize the switching delay in case of an active component failure. The good news is redundant hardware is simple to install, manage and maintain because the hardware does the work. The bad news is all this custom hardware adds up to an expensive server.

The Express5800 falls into the hardware redundant server category, but instead of using expensive proprietary components, it uses off-the-shelf Pentium III processors and off-the-shelf RAM. It has fully redundant subsystems — redundant processors, RAM, PCI slots, disk controllers and disks — available for the approximate price of two commodity servers in a cluster configuration. However, the Express5800 only supports Windows 2000 Advanced Server, which comes bundled with the box.

Features

The Express5800 is a little wider and heavier than the average server. The rear panel gives access to two power supplies that are hot swappable, redundant and can balance the load. You can also access a console panel, which has two Universal Serial Bus (USB) ports (for the keyboard and mouse), two serial ports and a video port.

There are no PS2 keyboard and mouse ports. You must use a USB keyboard and mouse, which is included with the server. If you have invested in a large keyboard, video and mouse switching system without USB capability for your server farm, you won't be able to incorporate the 5800 into your keyboard, video and mouse system.

The front panel has two full-height expansion bays, a CD-ROM drive, floppy drive, hard-drive enclosure, two redundant hot-swappable CPU/RAM modules and two redundant hot-swappable PCI modules. Each PCI module has four PCI slots and an integrated Intel 82559-based 10/100M bit/sec Ethernet port.

The CPU/RAM modules on our evaluation unit came with a single 800-MHz Pentium III processor with 256K bytes of Layer 2 cache and 256M bytes of RAM. A dual-processor option is available. The drive enclosure is segmented into two SCSI backplanes with three drive slots each.

Our Express5800 came with one 18G-byte hard drive connected to each backplane of the integrated drive enclosure for a total of two drives. Each drive has a partition for Windows 2000 Advanced Server and a data partition.

Both PCI modules have a dual-port SCSI controller. The two ports of each controller connect to the two backplanes of the drive enclosure. The two drives are mirrored using the software RAID capability of the operating system. This configuration provides redundancy with no single point of failure.

Net Results

NEC Express5800/320La

4.28
RATING

Company: NEC, www.necft.com, (888) 632-8701 **Cost:** $20,967 as tested. **Pros:** Highly redundant hardware, great price. **Cons:** Limited performance.

What's the score?	Express5800
Performance 40%	3.2
Features 30%	5.0
Manageability 20%	5.0
Serviceability 10%	5.0
TOTAL SCORE	4.28

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

Vendor and model
NEC Express5800/320La

Price
$20,967

Processor type
Intel Pentium processors, 800-MHz, cache

Number of processors
1 logical, 2 physical

Total number of processors supported
2 logical, 4 physical

Memory configuration
256M bytes logical, 512 physical in tested system (capable of 2G bytes logical, 4G bytes physical)

Number of RAM slots
4 logical, 8 physical

Expansion slots present
4 logical PCI expansion slots, 8 physical

Expansion slots available
3 logical, 6 physical

Disk controller
Dual-channel Ultra 160 SCSI controllers

Hard-disk description
1 18G-byte 10K bit/sec RPM logical, 2 18G-byte 10K bit/sec RPM physical in system tested

Number and description of hard-disk bays
3 logical, 6 physical

Network Interface
1 logical Intel 10/100M bit/sec Ethernet NIC, 2 physical

CD-ROM
24X maximum variable-speed IDE drive

Serviceability features
Hot-swappable modules housing CPU and RAM; hot-swappable power supplies; hot-swappable hard drives

Availability features
Redundant CPU, RAM, PCI cards and enclosures, Ethernet ports and power supplies

Manageability features
Hooks to CA Unicenter, Tivoli and HP OpenView; Management Workstation Application local or remote interface; ESM Pro hardware management application; Veritas Volume disk subsystem configuration and management

Security features
Lockable front bezel

Bundled software
Windows 2000 Advanced Server; Veritas Volume Manager 2.7; NEC ESM Pro; Express Builder; MWA (management workstation application)

Warranty
One-year warranty, next business day on-site labor (field-replaceable units — one-year on-site); three years parts (customer-replaceable units — three-year return to NEC)

The Ethernet ports share a common media access control address to provide network transparency when switching between network interface cards (NIC) if one fails. To add more bandwidth to the network, additional NICs can be loaded into the PCI modules and teamed to the integrated Ethernet port.

Performance trade-off

We gave a score of 3.2 points for performance, reflecting the single-processor configuration and disk-mirroring operation of our Express5800. Because we haven't tested any single-processor servers, we compared the 5800's performance numbers with dual-processor server performance numbers from past reviews.

The CPU tests placed the single-processor Express5800 at 43% of the performance of the fastest dual-processor server we've tested. This low number is a result of the single 800-MHz Pentium III processor as compared with a dual 1.2-GHz Pentium III server tested earlier.

The network performance numbers came in at 22% of the performance of the fastest dual-processor unit tested. Even when you consider the single-processor configuration, this isn't great performance. We figured the numbers must be attributed to the operating system driver and redundant hardware overhead.

www.nwfusion.com

More online!

- A complete set of performance charts for the NEC Express5800.
- A list of our previous server reviews.

DocFinder: 7824

File performance numbers were also low, coming in about 30% of the performance of the fastest dual-processor server we've tested. Again, some difference can be attributed to the single-processor configuration. But a good portion can be attributed to the mirroring operation of the disk subsystem. Servers we normally test are configured with RAID-zero to achieve optimum performance. The disk mirroring on the Express5800 is necessary to maintain disk integrity in the event of failure. This function has a large processing overhead, and reduces the resulting performance significantly. If NEC added hardware disk mirroring, it could provide a performance boost over using software disk mirroring through the operating system.

Availability

Availability is the Express5800's strong point, earning it a perfect score of 5.

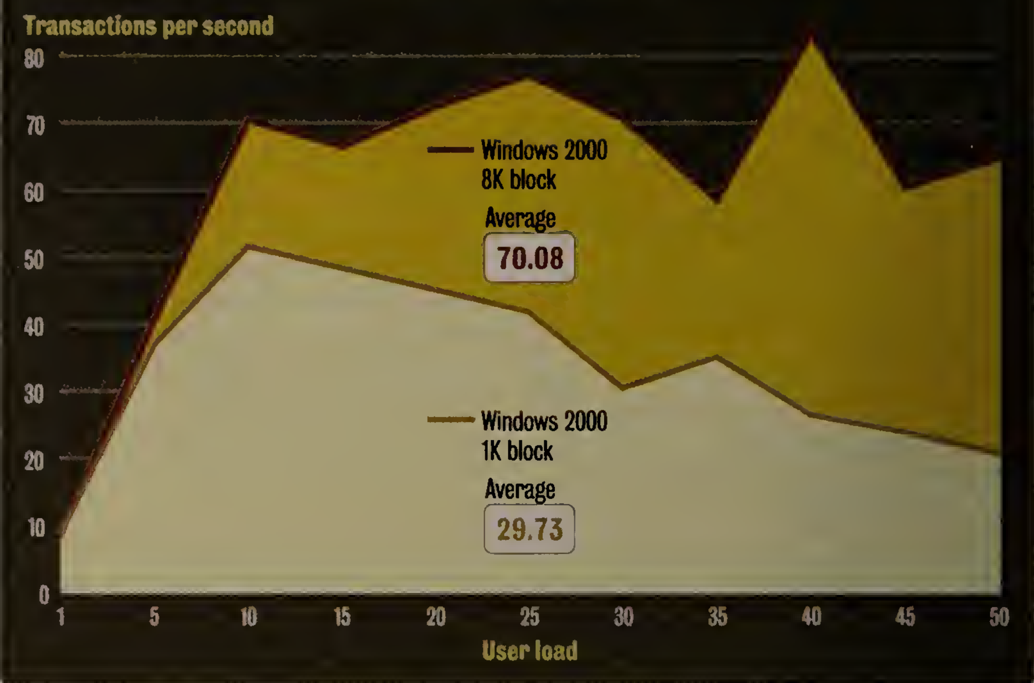
There is no single point of failure in the server. The switch-over capability of the hardware appeared transparent to our test applications. Hands down, this is the best availability device we've seen.

Serviceability

For serviceability, the Express5800 scores a perfect 5. The modules are easy to remove and replace. A simple LED layout lets you quickly determine what module is in a fail state. There are no covers to remove and no cables to untangle. All serviceable components can be removed and replaced without shutting down the server.

Performance data

NEC Express5800 server averages about 30 transactions/sec with 1K blocks, and 70 transactions/sec with 8K blocks.



Manageability

And the Express5800 scores another perfect score of 5 for manageability. It's bundled with NEC's Management Workstation Application (MWA), which can be accessed locally or remotely either in-band through the Ethernet port or out-of-band through the serial port.

MWA acts as an interface to ESM Pro, which provides a configuration mechanism for the server hardware regardless of whether the server is powered on. MWA provides hooks to standard management platforms such as Tivoli Systems' Tivoli, Computer Associates' Unicenter and Hewlett-Packard's OpenView.

ESM Pro provides a BIOS (firmware) upgrade mechanism without having to bring the server down and monitors hardware errors to determine error trends before a hard failure.

Conclusion

The Express5800 is a hardware redundant server with a much lower than normal price for this class of availability. With a nice price, you do have a performance trade-off. Whether the trade-off is worth it depends on what you want to do with the server.

Bass, a senior technical staff member at CNL and co-author of Building Cisco Multilayer Switched Networks, *designs and leads the execution of the test suites. He can be reached at john_bass@ncsu.edu.*

Server testing is performed at North Carolina State University's Centennial Networking Lab (CNL) in Raleigh, N.C. CNL tests networking equipment and network-attached devices for interoperability and performance.

How we did it

Our test bed includes 13 clients with a minimum configuration of two 400-MHz Pentium II processors with 128M bytes of RAM. Each client has one 100M bit/sec Ethernet network interface card for connection to a Cisco 2948G Ethernet switch. The server under test is connected to a Gigabit Ethernet port of the switch.

We used Quest's Benchmark Factory software to coordinate the test development, client load, result gathering and archiving for all the tests. We ran a series of file, network and database tests against Windows 2000.

Using the Benchmark Factory software, we defined several tests to look at the performance of the file subsystem. We broke our benchmarking tests into two categories: small-file and large-file transfers.

For the small-file transfer tests, we used a three-dimensional test matrix of transfer direction (read/write), block size (1K byte/8K byte) and transaction type (random/sequential). This test matrix resulted in eight tests. We separated all combinations into individual tests to see how each server would react in each situation. The small-file transfer tests use a file size mix of 80% 1K-byte files, 10% 10K-byte files and 10% 50K-byte files.

For the large-file transfer tests, we combined the reads and writes together in the same tests. Then we created a set of tests that covered all combinations of the transfer type (random/sequential), and block size (1K byte/8K byte). This resulted in four tests. The reads and writes were combined because this emulates large-file service behavior for services such as FTP and home space services. The reads and writes were distributed as 90% reads and 10% writes. For each of the large-file transfer tests, the file size distribution was 80% 500K-byte files and 20% 1M-byte files. Ninety percent of each of the file sizes are reads, and 10% are writes.

Each of the files needed for each virtual user was created at the beginning of each test. Each test ran five iterations of increasing load. The number of virtual users started on each client controlled the load. The number of virtual users for each step was found by running each of the tests against each network operating system to find where the top of the performance curve lay. From there, we determined a standard set of load parameters to run the tests.

The CPU database test used Microsoft SQL Server 7.0. We increased the number of virtual users from two to 30. The number of virtual users in no way implies a limitation of the database server. Each virtual user in our test is atypical of a 'real world' user in that the load generated by these virtual users is much larger. Each virtual user calls a computationally heavy SQL statement thus reducing the number of network transactions per unit time to concentrate the load on the processors. The virtual users then waited 9 seconds before executing the SQL statement again.

We used another database test employing a much less intensive transaction to test the network I/O performance of the server. This was achieved by generating a large amount of transactions against the server. Like the CPU database test, the number of virtual users is increased from two to 30 to obtain a characteristic performance curve.

Global Test Alliance

■ Bass is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

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NetworkWorld

First look

Bring in the (802.11)A team

The first look at high-speed (5GHz) wireless LAN products.

■ BY TOM HENDERSON AND TIM RITCHEY, NETWORK WORLD GLOBAL TEST ALLIANCE

Wireless Ethernet just got a boost: The A Team arrived, and it is significantly faster than the B Team. The first batch of 54M bit/sec 802.11a products is shipping, and we tested samples pointed toward enterprise and smaller installations. These products will be known by the Wireless Ethernet Compatibility Alliance designation Wi-Fi5 — when they pass WECA's interoperability tests scheduled for this spring.

Products based on 802.11a are supposed to be very fast and not as rife with mistakes as earlier products in the 802.11b/Wi-Fi space. The first batch of products we tested have obviously benefited from the 802.11b experience. They were easy to set up and configure, but the choices varied widely. And while the 802.11a interoperability was good, we found the nonstandard high-speed modes (where available) didn't interoperate. The temptation to use these modes will be high and will likely force buyers to source through one vendor unless a movement is made to achieve de facto rather than standards-based interoperability for these "turbo" (multichannel, nonstandard) modes.

We tested four early released products from three companies that represent two differing target markets (enterprise space and small to midsize businesses): Proxim's Harmony (targeted at the enterprise space), Proxim's Skyline Access Point, Intel's Pro/Wireless 5000 and SMC Networks' 2755W access point. All four are based on the same wireless chipset/reference model from Atheros, but unlike cookie-cutter 802.11b products, their flexibility, management and performance varied. And unlike former iterations in 802.11b access points, they all look aesthetically different.

In our tests, three of the four units performed consistently, Proxim's two products and Intel's 5000. The speed demon (over the widest broadcast range) in the bunch, SMC, had very fast performance — and occasionally had highly erratic behavior until we downloaded "another Version 1.0" of its firmware. Because the markets that the products are reaching are different, and because the products are in their early stage, we didn't score this as a traditional comparative review.

SMC's 2755W access point was the speediest across a wide range.

Compatibility between different access points and the CardBus adapters supplied was very good. In 802.11a mode, which runs at up to the 54M bit/sec data rate, all the adapters could connect to every access point — even with Wired Equivalent Privacy (WEP) encryption enabled. In ad hoc mode (connecting two PCs without an access point), all the adapters worked well together with the other access points, with some cards having better speed.

But when we used the access points' turbo mode between an access point and a competing adapter, we couldn't achieve a connection between that card and the access point.

For now, turbo modes shoot compatibility dead between different products, resulting in a disappointing performance.

Performance

With the older IEEE 802.11b cards, the stated data rate is up to 11M bit/sec, and typical performance (data throughput) is about half that rate under ideal conditions. Consider also that 802.11b cards send some signals at 1M bit/sec data rate, and have considerable overhead in traffic.

At the seemingly blazing data rates advertised for 802.11a, 54M bit/sec performance would make this about five times faster than 802.11b. This was true under ideal conditions.

Proxim clocked in the fastest modes, both in compatibility mode and with its own access point. Running against the Intel access point, the Proxim card turned in a 22M bit/sec score. Proxim also turned in the best score with its own access point, with 17.6M bit/sec as measured by our FTP program (see How we did it, page 58).

Things changed when we tested range. In close range, Proxim was fastest on average. But SMC's access point had the best range. For consistent numbers, Intel's was slowest on average overall, but was the most consistent across different ranges.

In our tests where we took the adapters and ran them against the other access points, SMC's adapters were most consistently speedy over the widest geographical range. But we also had the most difficulty in completing our tests with these adapters. During the testing, one in seven tests failed with the SMC adapters when linked to the SMC access point until we reloaded the firmware. We got the feeling we had received prototypes instead of working units and later confirmed this. Oddly, links from the SMC notebook adapters to other hubs were otherwise consistent and performed well.

SMC's 2755W access point also had the best range of the devices tested. In the multistory office building tests, the SMC access point was the only one that gave usable (if very slow) results on the floor above the access point. Antenna positioning, avail-

Net Results

EZ Connect 2755W Wireless Access Point; EZ Connect 2635W CardBus 802.11a adapters

Company: SMC Networks, (800) 762-4986, www.smc.com **Cost:** $365 for access point; $145 for adapters. **Pros:** Excellent range; fastest "Turbo Mode." **Cons:** Inconsistent performance; random freezes; weaker security. **Market:** Small or midsize business or home-office settings.

Proxim Harmony Access Point; Skyline Access Point; CardBus 802.11a adapter

Company: Proxim, (800) 229-1630, www.proxim.com **Cost:** Harmony Access Point, $700; Harmony Access Point Controller, $1,500; Harmony 802.11a card, $230; Skyline Access Point, $450; Skyline 802.11a network card, $180. **Pros:** Excellent management options; very good security; fastest 802.11a compatible mode. **Cons:** Inconsistent performance; weak range in "2X" mode. **Market:** Enterprise settings.

Intel Pro/Wireless 5000 access point; Intel Pro/Wireless 5000 CardBus adapters

Company: Intel, (408) 765-8080, www.intel.com **Cost:** Access point, $450; CardBus adapter, $180. **Pros:** Consistent performer; easy setup. **Cons:** Slow, but steady; weaker security and management options. **Market:** Small or midsize business or home-office settings.

able on Proxim access points and the SMC access point, didn't have much impact on the results

Of the access points tested, Intel's was the only unit that shipped with mounting hardware and was also the heaviest.

Proxim says the Harmony line will soon support Power-On-LAN (POL), a method that puts power onto unused pairs in a Category 3, 4 or 5 cable connecting an access point, but this feature wasn't available in the units we tested. SMC and Intel do not claim support for POL. All three units shipped with transformers for power, and the SMC access point had the shortest power cord.

Performance

Performance rates for access points and turbo modes (in M bit/sec) in our FTP application:

Vendor	Mode	Nearby	60 feet	72 feet
Intel	802.11a	12.8	8.8	5.6
SMC	802.11a	14.4	13.6	10.4
SMC	Turbo	21.1	15.6	10.3
Proxim*	802.11a	15.2	7.2	3.2
Proxim	2X mode	18.4	8.8	3.2

* Proxim's Harmony and Skyline access points had the same performance.

Management features

Proxim's Harmony product line uses a central wireless hub management appliance to control the Harmony access points. The management appliance then controls the Proxim access points (802.11a or 802.11b) on a subnet.

We found the Web-based access point controller application to be incredibly thorough to use with multiple Harmony access point deployments.

If the Harmony access points are located on the same subnet, an access point controller can be set to apply rule sets to any newly joining Harmony access point. Indeed, we found that when the controller goes offline, the access points stopped within a few seconds — they're slaves to the controller.

Proxim also produces an access point in its Skyline product line — its characteristics were virtually identical in performance. The main difference between Skyline and Harmony is the management relationship between the access point controller and Harmony access points.

The Harmony line also includes a proprietary encryption algorithm that's different from WEP, although Proxim refused to say how it's different. This encryption method is in addition to the 54-bit through 128-bit WEP encryption methods available and common to all the access points we tested.

Another Harmony feature is a forced VPN tunneling method that can also force logons to a single server. This adds much security to mobile networks, which potentially could dramatically reduce drive-by logon risks. Additional security imposed at the server that is the target of the tunnel requires the drive-bys to also get past whatever security is imposed at the server.

The Harmony access point controller also supports Remote Authentication Dial-In User Service (RADIUS) for added authentication, media access control (MAC) layer address admittance control and SNMP for monitoring. Multicasts and IPX debris such as Routing Information Protocols and SAP server.

The Intel access point has fixed anten-

See 802.11a, page 58

Statements from the 'big boys'

A lot of the enterprise players in 802.11a wireless have held off on producing 802.11a products. Here's how some of them see the market:

Enterasys Networks

"We took a look at what 802.11a gives us today and what it will provide six to nine months from now. Because 802.11a products need to be enhanced with functionality from the emerging 802.11a (security) and 802.11h (international power control) standards in six to nine months, and we feel that this functionality is essential to an enterprise 802.11a wireless solution, we decided that we are not going to ship an 802.11a product today. Instead, we will ship the upcoming version of 802.11a when it is ready in six to nine months. This will be in our dual-slot RoamAbout R2 access platform, and we will have a solution that customers can use to upgrade their existing RoamAbout R2s to the 802.11a standard when it includes these enhancements, and therefore the security and interoperability requirements for the enterprise are met."

Cisco

"In terms of Cisco's view on 802.11a:

- Current 802.11a solutions are not enterprise-ready.
- The lack of 802.11a backward-compatibility is a concern.
- Performance is not a crucial factor of most deployments.
- 2.4GHz interference is not a practical concern.
- Cost, power, range, security and interoperability will drive 802.11a deployment.
- 802.11b and 802.11a will co-exist."

Symbol

Symbol recently announced the Symbol Mobius wireless LAN architecture to deliver high-speed 802.11a communications while protecting customers' investments in 802.11 and 802.11b infrastructures. The first product will be the Mobius 5224 Access Point. Later in 2002, Symbol plans to bring 802.11a-capable handheld mobile computing devices to the market.

"While there is a lot of interest in the new 802.11a technology, it is important to support the installed base of wireless LAN users while offering the next generation of technology," Symbol's Ray Martino says. "Because Mobius enables an intelligent adoption strategy, enterprises can avoid a 'rip and replace' strategy."

Agere Systems

"We do not see the 802.11a market taking off in 2002 because of price, coverage and the available spectrum, specifically in Europe. Agere believes that the majority of these issues will be resolved by late 2002, and that volume shipments will start during the course of 2003. Our current AP-2000 and AS-2000 products are 'A' ready. IT managers can buy and install these enterprise access points now using current B cards. When Agere ships the 'A' cards, they can simply pull the 'B' cards and insert the 'A' cards."

Explaining 802.11a

While there are strong similarities between 802.11a and 802.11b, there are also important differences. First, there's confusion about why 802.11b products came before 802.11a. Confounding the problem is that 802.11g is on the horizon. Like most oddities in computing, you need some history and a score card to keep the versions straight (with even more 802.11x versions coming soon).

The original purpose of the IEEE's 802.11 committee was to research metropolitan-area networking (MAN). While MANs have been around for years in various forms, the considerations of the committee turned toward wireless distribution methodologies. The high data rates needed to make wireless networks a viable option requires spectrum — an allocation of frequencies that can be used. The power needs to be low enough to prevent interference with other users of the frequencies, but strong enough to allow consistent data rates at speed.

When the frequencies are allocated, there must also be considerations made for users with different applications on the same frequencies. The 802.11b products arrived first because of several reasons, not the least of which was the near worldwide acceptance of the 2.4GHz range for low power, usually license-free operation. Cordless phones use this spectra, and so do microwave ovens, HomeRF and Bluetooth devices. It's a potentially dirty spectrum in some ways, but there are often configuration methods that let the 802.11b products be modified to find empty transmission space if and when interference is detected.

There are three nonoverlapping channels that can be used in 802.11b. This means placing transceivers/access points in ways where they won't have interference with one another. Eight such channels are available for 802.11a access points and the network geographies that they can serve. This means that the A Team has a better chance of covering geography than the current B Team. However, a heretofore-unused specification, 802.11g, proposes to add more channels and therefore more potential bandwidth and a potential reduction in overlapping geography. The 802.11g data rates are said to be the same as 802.11a. Products might ship using 802.11g this year.

After study and regulatory approval, the 5.25GHz to 5.45GHz and 5.725GHz to 5.825 GHz ranges were deemed usable, and 802.11a production began. This is a huge amount of spectrum — more than most broadcast television channel spectrum combined.

By design, there are eight possible channels in the band that can be used; broadcasting on these channels is unidirectional. The current crop of 802.11a devices are approved in North America, and limitations are imposed on them in Japan.

Soon, with regulatory approval, European versions and other areas will soon be approved for the frequency range that 802.11a needs. Receiving and transmitting on 802.11a (and b) is performed by contention in a similar way to Ethernet.

— Tom Henderson and Tom Ritchey

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802.11a

Continued from page 56

nae. An option is available to limit the antenna pattern to "half-circle front" from an omnidirectional pattern. We found only a nominal boost in performance when we chose this option.

Like the other access points tested, the Intel unit has a wide choice of channels. No provision is made for traffic or protocol filtering.

While slow on performance, it was consistent across the ranges. We tested the Pro/Wireless 5000 less than the others because it had no errors and no additional modes to test.

Sometimes boring has its place in connectivity; Intel's product was consistent and satisfying in its consistency.

Features

We got a hint of trouble with SMC's 2755W access point when the Web interface kept asking if we wanted to install a Chinese language pack. We had to consistently decline, even though the interface was in English at every page change. This, with other inconsistencies (a sample that wouldn't update and highly erratic performance) led us to believe we had prototypes and not production units. We were right and received production units from SMC. A new firmware update from SMC's Web site for the 2755W units removed the aforementioned problems.

Installation was simple. SMC has a setup wizard that is similar to Intel's rapid deployment method. Help screens that were offered were only nominally useful in describing functionality.

How we did it

We tested the access points and cards in a single-floor office building (with steel wall studs and a sheet metal roof) and a nine-story office building. In the single-story building, we set three test points: 3 feet, 60 feet through two walls, and 72 feet through four walls from the access points, which were mounted at the top of a free-standing rack.

We configured two identical Compaq Presario 700 notebooks, each running Windows XP Professional, to be clients. During our initial test phases, we immediately found problems getting good results. It appears that the client IP stack on XP Professional has problems — especially with the SMC drivers. We reconfigured one of the Presario 700 notebooks to run SuSE Linux 7.3 and serve an FTP server, and achieved consistent results.

The test procedure used the XP Professional Client's FTP application to get a 36M-byte file. The data rate performances recorded were the data rates specified by the XP command line interface-based FTP application on an average of 10 iterations after we threw out the two worst scores (which seem to come from aligning cache through the delivery chain). Note that a baseline wireline measurement through the Presario 700's built-in Realtek 100Base-TX network card yielded a rate of 78.4M bit/sec.

Like the others, SMC's access point has provisions for choosing data rate minimums (for acceptance as a client to the access point) and a power selection. These features allow tailoring of multiple access point coverage. A lower power rate might prevent interference with another access point, and data rate minimums prevent accidental cross-access point logons in some installations. Performance is more affected with power choices in the SMC 2755W than the antenna directionality choice in the Intel Pro/Wireless 5000.

The SMC access point has similar security constraints as the Intel Pro/Wireless 5000 by not supporting VPN (as a client stack only), tunneling, homed servers, RADIUS or encryption beyond WEP security. Like the Intel Pro/Wireless 5000, it does support access control lists by MAC layer and WEP key control.

SMC's turbo mode is designed to run at up to 72M bit/sec. We found this mode fastest of all tested. Of particular note was that at higher data rates, the range vs. data rate wasn't affected as much as with the Proxim Harmony access point.

Range was less affected in the nonstandard turbo mode than Proxim's range with its turbo mode. SMC had the best performance for all the tests, despite occasional inconsistencies. However, we also were concerned that we might be transmitting illegally because of the frequency ranges.

Some ready for prime time

We feel this fresh crop of access points is ready for use. Proxim's Harmony system is time-proven, and we feel the difficulties we saw are related to the new 802.11a software (drivers for the access point and notebook adapters). SMC's access points were eventually consistent, as the range was good and the turbo mode seemed to work very quickly over a wide range. Where the simple criteria of speed and range are concerned, SMC shines.

However, we'd like to see better security from SMC and Intel. The lack of RADIUS support hurts companies that would depend on them. Clearly, Proxim's Harmony product is the most enterprise-ready of the early A Team access points. Proxim's access point controller creates additional expense in a wireless network, but its many security features (while not enhancing interoperability) and rapid deployment capability are compelling.

Another failing is the lack of a PCI-bus adapter. We were warned not to use CardBus/PCI adapter cards that we use with 802.11b because the cards might not survive. We could find no PCI bus adapters for the current crop of 802.11a CardBus adapters, and this shuts out desktops from participating in the higher-speed wireless networks — at least until PCI bus adapters and Universal Serial Bus adapters come to the marketplace.

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Global Test Alliance

■ Henderson is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

On the horizon

The initial products in the 802.11a space were based on the Atheros chipset. Here are some other companies that have announced plans for products:

Company	Web site	Market/products	Shipping
Accton Technology	www.accton.com	OEM and ODM customers and vertical markets; SMC is a subsidiary of Accton Technology.	Now shipping 802.11a access point and 802.11a wireless CardBus adapter.
Actiontec Electronics	www.actiontec.com	Retail, OEM customers and vertical markets.	Now shipping 802.11a PC card, access point expected by end of January. Other products coming soon include 802.11a mini-PCI card, a dual 802.11a/V.92 mini-PCI and a dual 802.11a/802.11b mini-PCI.
D-Link	www.dlink.com	Will ship a complete line of 802.11a products for enterprise, small and midsize businesses, and education, verticals and OEMs.	Announced the D-LinkAir Pro series, a PCI adapter (DWL-A520), PC Card adapter (DWL-A650) and access point (DWL-5000AP). High-volume shipping in the first quarter of 2002.
Intermec	www.intermec.com	Access points and client cards for enterprise, industrial, manufacturing and retail sites.	Two 802.11a products in the late first quarter or early second quarter 2002; MobileLAN 2106 access point and the MobileLAN card 54. Additional products scheduled for the third and fourth quarters of 2002.
NetGear	www.netgear.com	Complete family of 802.11a products, including access points and adapter cards for retail, SOHO and small businesses.	Recently announced HA501 Wireless PC Card for notebooks, HE102 Wireless access point, and HR814 Cable/DSL router. Shipping between end of January and April 2002.
TDK	www.tdk.com	CardBus and mini-PCI client cards, a value-line access point for home use, and a feature-rich access point for small-office applications for corporate and OEMs in North America.	CardBus card currently available in Japan, available in North America by end of the first quarter of 2002; mini-PCI card shipping to OEM partners in the first quarter of 2002; access point available in North America by end of the first quarter of 2002.
UltraDevices	www.ultradevices.com	Broadband wireless access gateways, base stations, provisioning and network management systems for broadband ISPs, wireless ISPs for homes and small and midsize businesses, and public access hot-spot operators.	Products expected in spring 2002.

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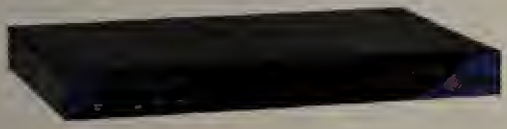

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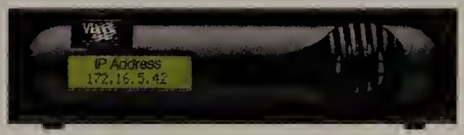

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Extreme programming

Popular development process can speed creation and boost quality of your network projects.

BY ARTHUR ENGLISH

Looking for a way to optimize creation of network software in your IT department? The lightweight development process of extreme programming might be the ticket.

XP helped IP traffic management vendor Opnix reduce the cost-of-change curve. Late in development of the vendor's main product, the team discovered a serious bug in a portion of the system that had been written many months before. Fixing the bug required redesign of a core component of the system. The team rose to the challenge and rewrote a full 7% of its entire codebase in less than eight hours, which worked out to about a line of code every minute and a half per developer. All the unit tests still ran the same at the end of the day, proving the developers hadn't broken anything with their changes, says Jiva DeVoe, vice president of software development for Opnix.

Known by the acronym XP well before Microsoft began using it for Office XP and Windows XP, the development methodology has caused as much of a stir as Java, .Net, XML and Web services. Kent Beck created XP in 1996 while leading the Chrysler Comprehensive Compensation project to rewrite the automaker's payroll system. Since then, Beck has written a series of books on XP for Addison-Wesley, including *Extreme Programming Explained: Embrace Change*.

Proponents of XP seek to improve software quality, increase productivity and reduce costs. "XP has enabled our firm to deliver on-time, on-budget projects in 40-hour workweeks for clients in a variety of software environments, including C++, Java and even Visual Basic," says Ted Waltman, president of consulting firm IFC.

XP is an evolution, not a revolution, and many of its techniques have been around for decades. Here are XP's 12 core practices:

1 **Metaphor** guides all development with a simple shared story of how the whole system works. XP encourages stories, which are brief descriptions of a system task instead of more traditional Unified Modeling Language diagrams and models. Metaphor expresses the evolving project vision that defines the system's scope and purpose.

2 **Planning Game** encompasses requirements definition and project planning. End users define application features with stories. Programmers prioritize the stories and schedule the most important and difficult for the next iteration. Only the programmers who work on a story may estimate how much time it will take to complete. Tackling the most difficult tasks first is to reduce the overall risk associated with the project.

3 **Small Releases** containing the most valuable business requirements are used to build the system. Releases should be delivered every two to three weeks so customers get to see and touch the working product on a regular basis.

4 **Simple Design** discourages complexity. Simple Design focuses on delivering a system that meets the customer's immediate needs — no more and no less. The traditional approach of building "hooks" for future functionality leads to large systems with substantial elements that are initially unused and untested, and often discarded.

5 **Testing** is continuous. Programmers write unit tests to validate correct operation of modules before they write functional code for the module under development. Customers then write system tests to demonstrate that requirements have been satisfied.

6 **Refactoring** is the process of restructuring the system to remove duplication, simplify code and add flexibility without changing how the code operates. Even if you don't buy into XP as a whole, this is a process you should consider.

7 **Pair-programming** entails two programmers working side by side to develop and discuss each other's code. This is the most controversial aspect of XP. Although pair-programming may not be for everyone, anecdotal evidence on the XP mailing list (extremeprogramming@yahoogroups.com) demonstrates success. Before trying to implement this, your development team might want to attend an XP programming boot camp to learn how to collaborate XP-style.

8 **Collective ownership,** which lets any programmer change any code in the system at any time, is similar to open source programming. This approach is markedly different from traditional methods in which a single developer owns a set of code. XP proponents argue that the more people who work on a piece, the fewer bugs will occur.

Waltman says collective code ownership plays a key part in meeting user demands for system changes. "Last-minute changes can be a team effort, not an individual workload crisis," he says.

9 **Continuous integration** is a day-to-day activity. Code is integrated and tested after a few hours or a day at the most. Integration of one set of changes at a time simplifies the integration process and makes it obvious who is responsible for fixing the code when integration tests fail.

10 **Forty-hour workweeks** are highly encouraged on XP projects. As Beck says, it's OK to work overtime when it's required, but don't do it two weeks in a row. Having rested, motivated developers boost productivity.

11 **On-site customer** is a designated person who works with the team and is available to answer questions, resolve issues and set priorities. The customer, after all, is the final arbiter of system acceptance. This customer representative remains with the development team throughout the project.

12 **Coding standards** are a mandated requirement — not a set of guidelines. Programmers follow common rules so all code in the system looks as if it were written by one person. Create code standards that work for your team and consistently apply them.

XP really shines on projects in highly dynamic business environments where change is the norm. Consider using XP as a way to improve quality while reducing costs. Although you may not buy into the entire XP practice, you should consider adapting portions of it along with other approaches that can improve the bottom line.

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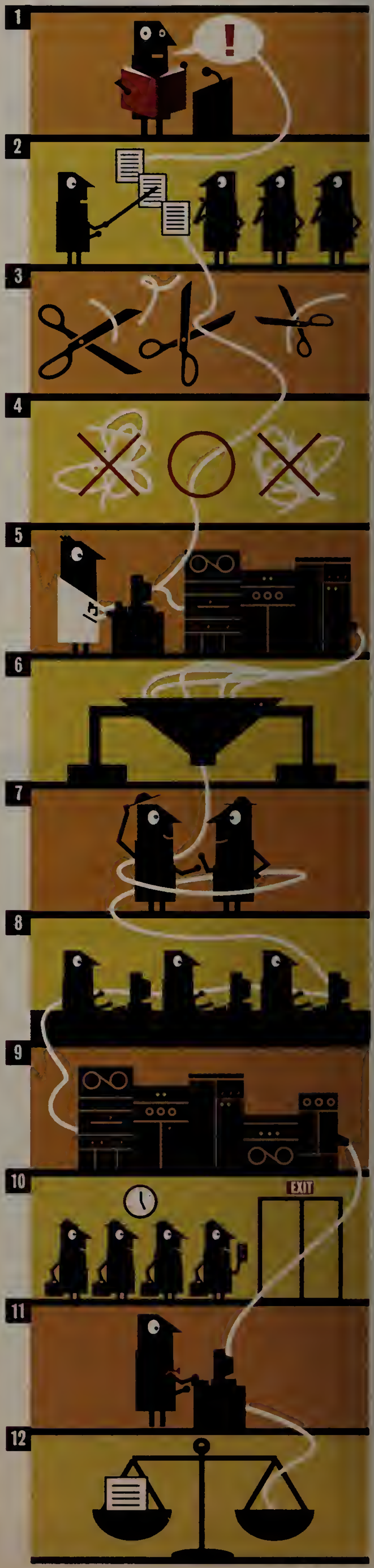

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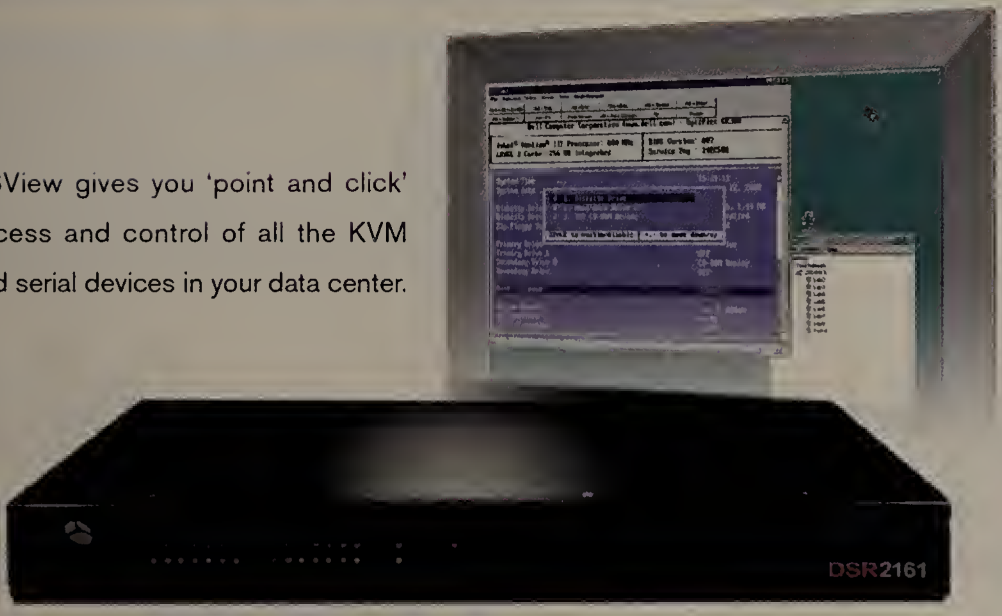

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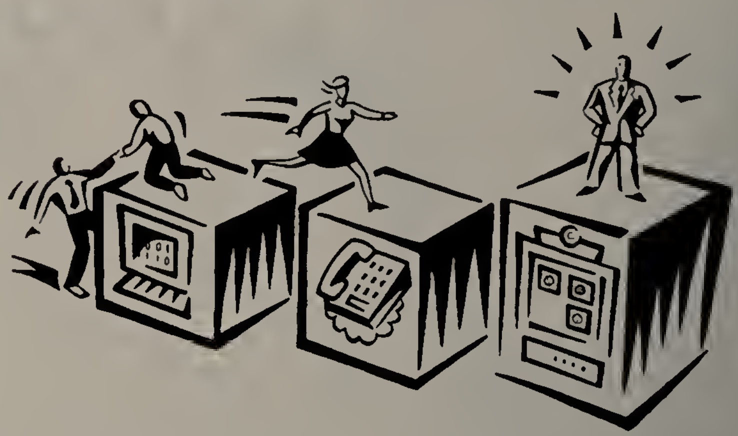

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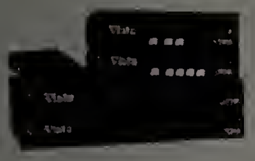

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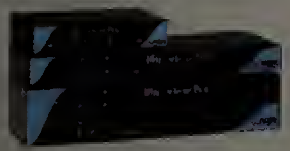

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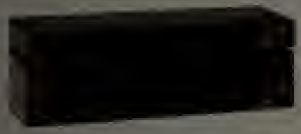

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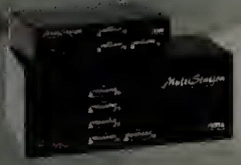

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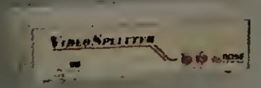

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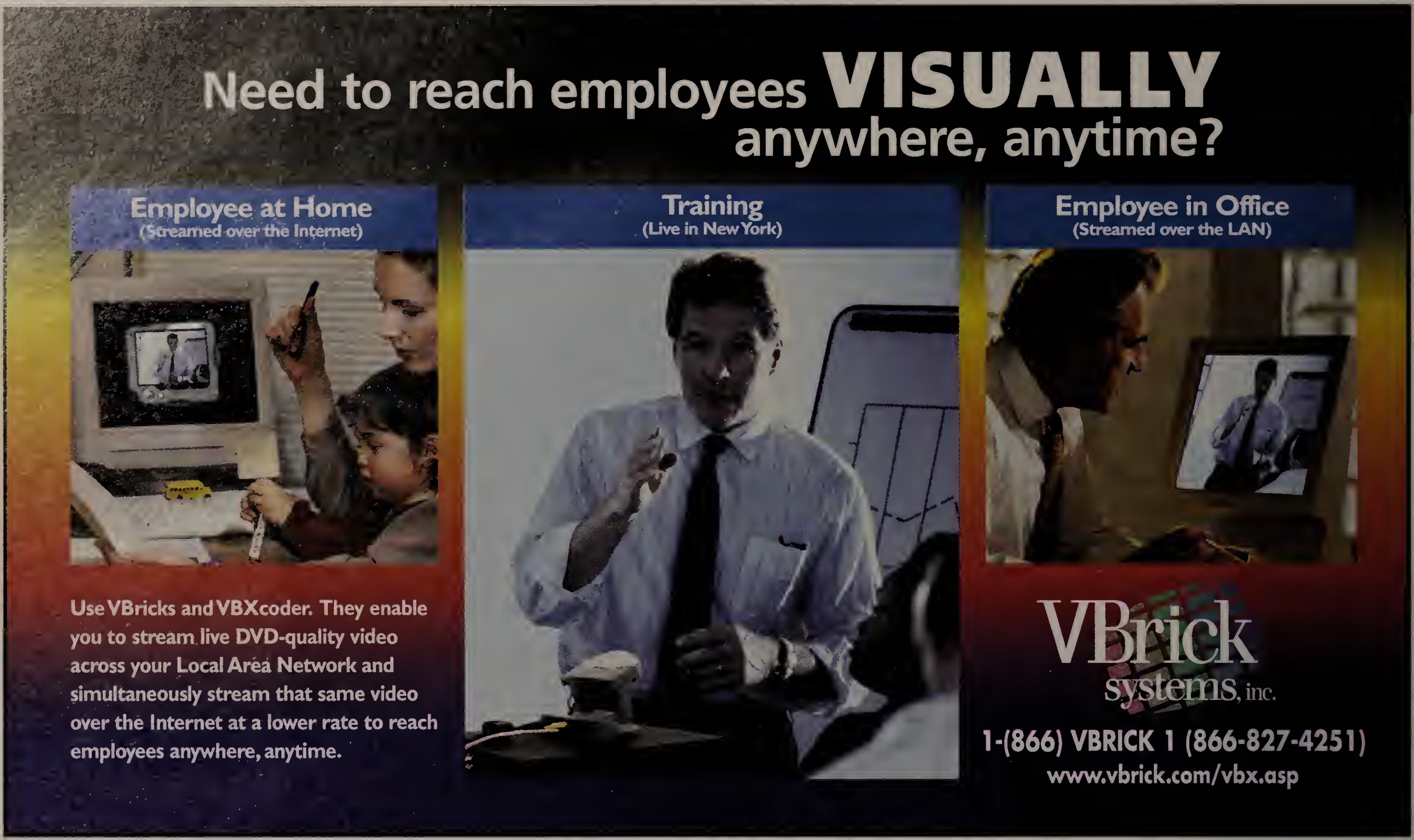

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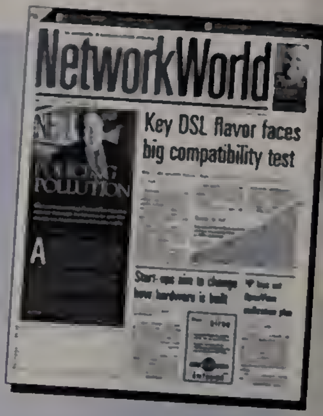
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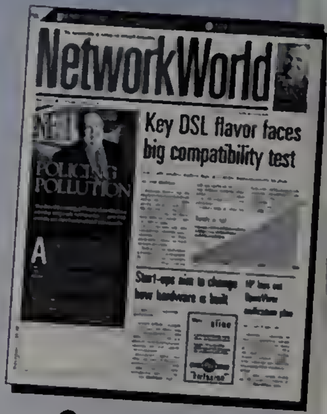
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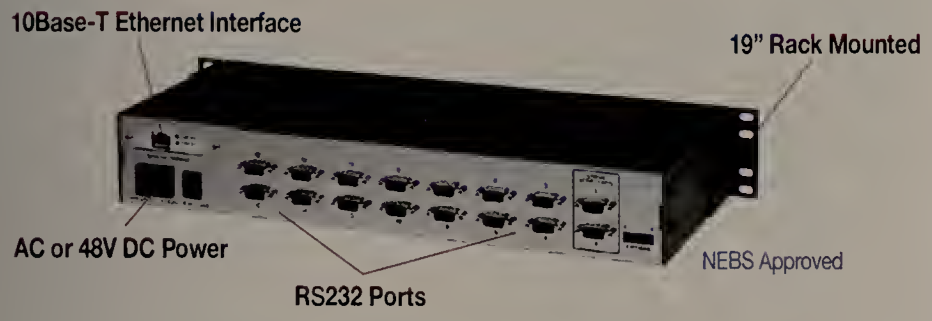

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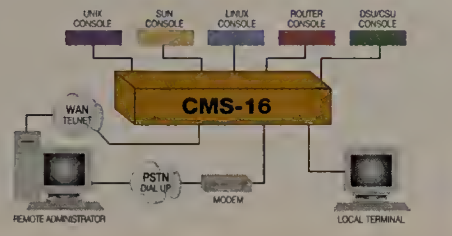

Telnet and Dial-Up Network Power Switch

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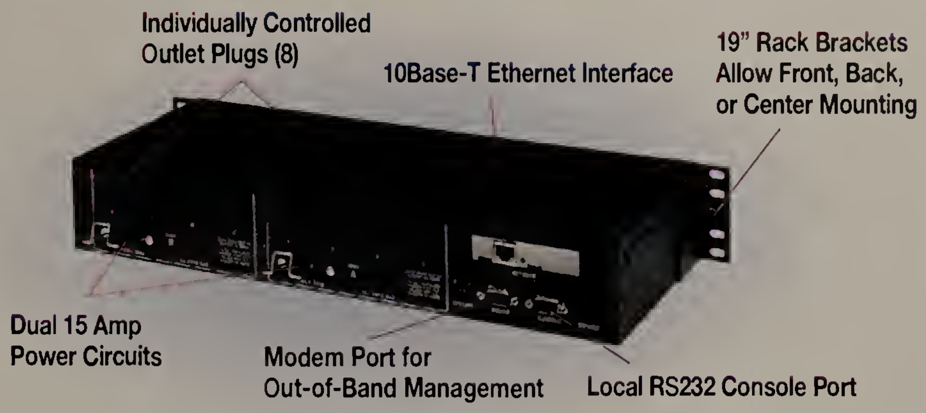
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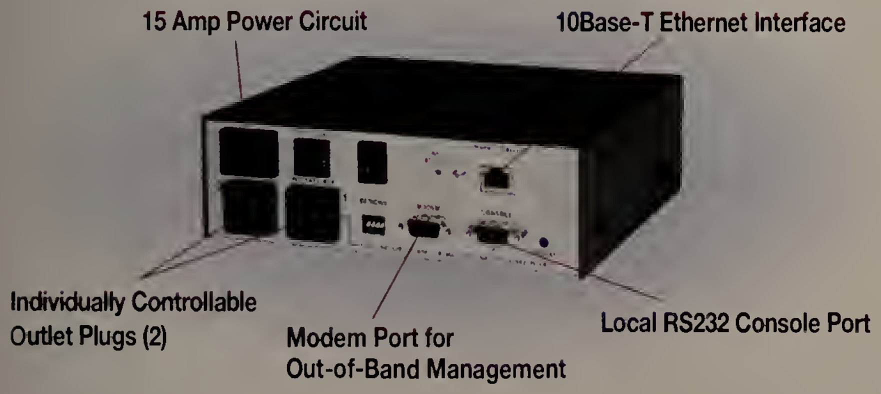
15 Amp Power Circuit
10Base-T Ethernet Interface
Individually Controllable Outlet Plugs (2)
Modem Port for Out-of-Band Management
Local RS232 Console Port

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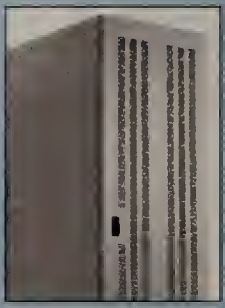
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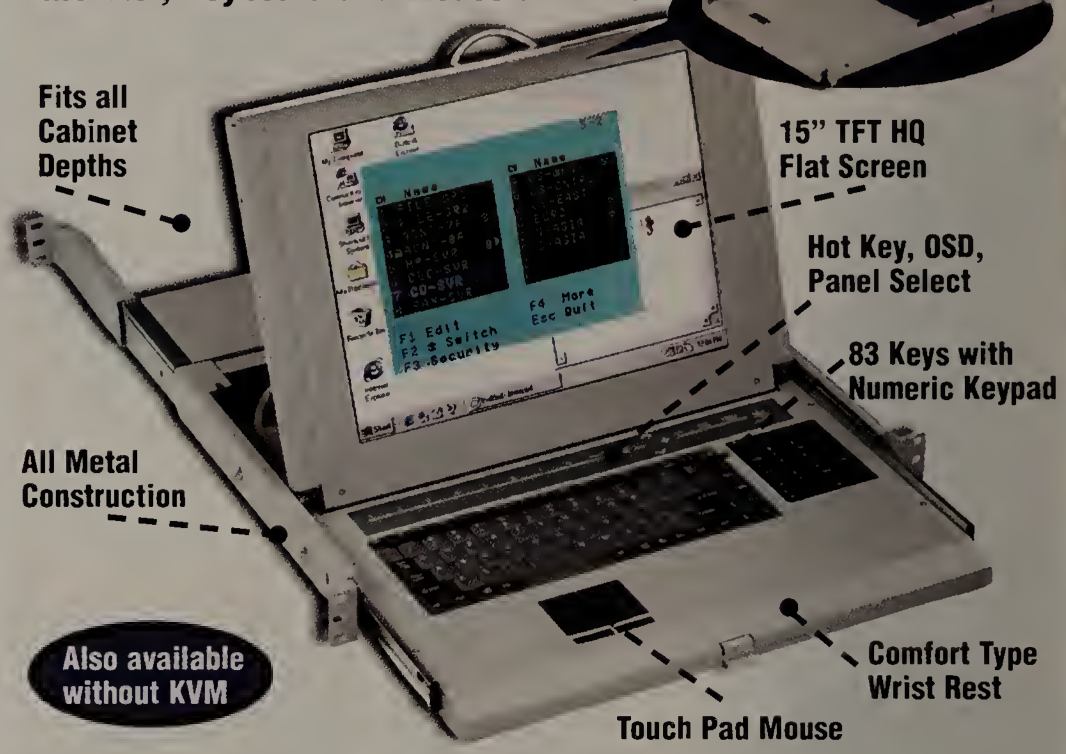

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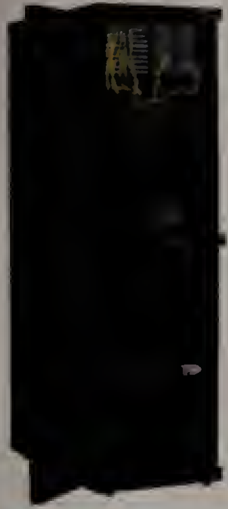

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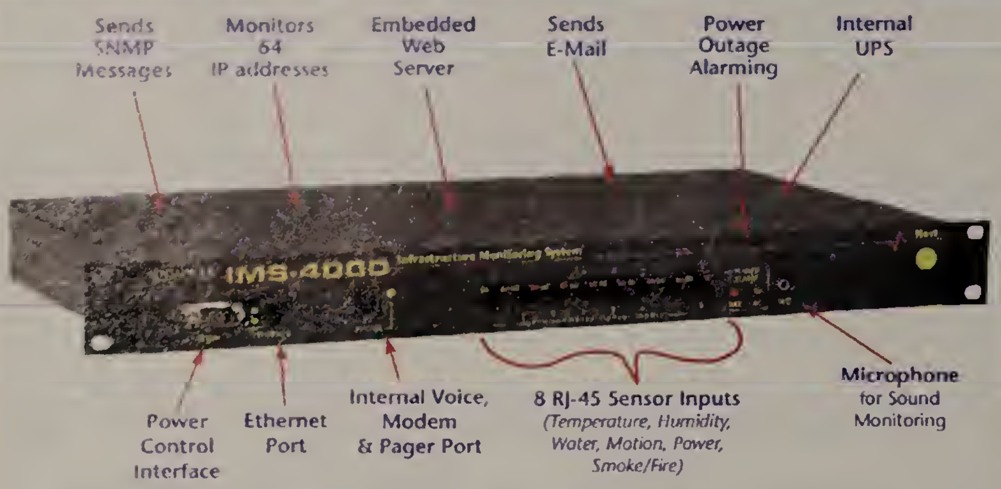
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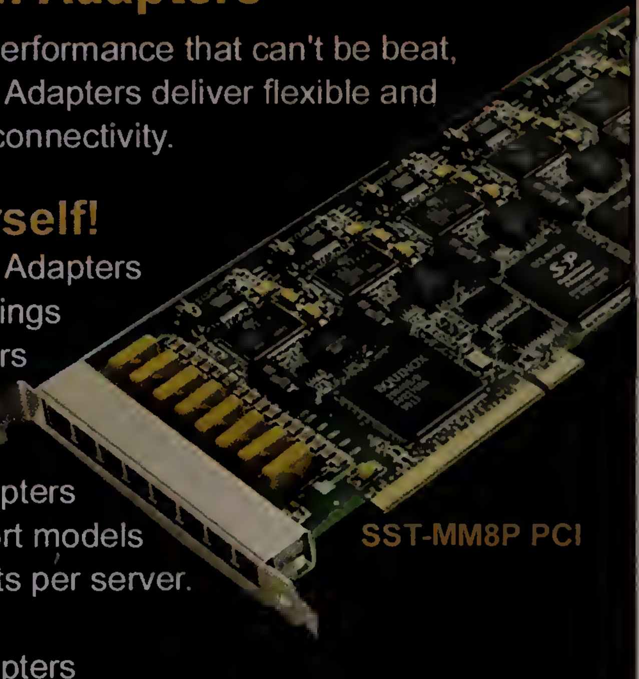

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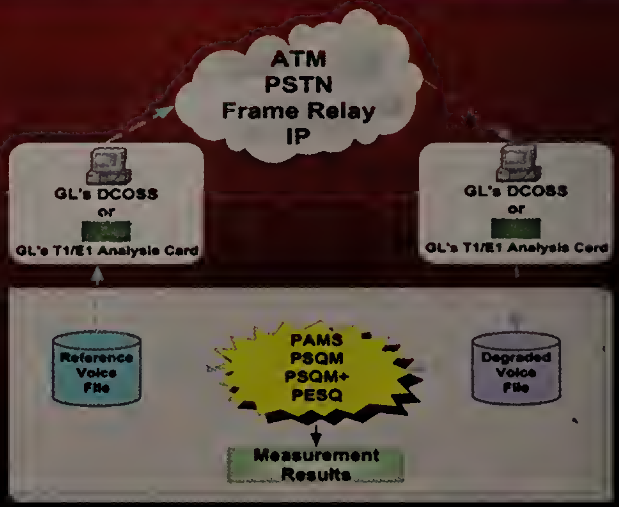

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While the telephone equipment market isn't expected to rebound until late 2002, wireless communications companies continue to consolidate. With consolidation, comes opportunities for IT professionals linked to the variety of systems and technology needed to integrate the merged companies that became Verizon Wireless.

Diane Litchko, associate director for IT staffing at **Verizon Wireless** in Bedminster, NJ, says that **Verizon Wireless**' 2000-2001 IT merger activity has focused on converging 13 different billing systems into eight. That will now be reduced to two or three final systems over the next several years. The company also just announced it would be acquiring certain Dobson Communications Wireless and Price Communications Wireless Operations to extend its service in the Southeast, Midwest and West regions of the country. "That means we will be incorporating these new operations into the company, requiring still more conversions of our business systems," she explains.

To lead these conversions, **Verizon Wireless** hires specific skills. These include the COBOL developers who will enhance and maintain the billing systems and DB2 developers and administrators who may work with the point-of-sale systems. "On our back-end operations, we look for JAVA development experience, UNIX administrators, PeopleSoft and Oracle database administration skills," she adds. "Our e-mail system operates on NT, so that type of technical background also has potential. To a much lesser degree, we continue to selectively hire telecom and LAN/WAN talent."

Litchko says that with the current state of the economy, there aren't as many openings at **Verizon Wireless** as a year ago. "But we continuously reevaluate to assure we have needed skills," she says. "We are now strategically hiring to meet our business plan. We look for people who have an ability to work on teams, who have skills in project management and who can lead and communicate. We really stress that individuals take accountability for their work, their customer relationships, quality and innovation."

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Shrinking

continued from page 1

Despite the worst economic downturn in a decade, Internet growth during 2001 was strong in all areas:

- The number of host computers connected to the Internet topped 137 million, up 40% over the 97 million recorded in December 2000.
- Traffic on the U.S. portion of the Internet's backbone surpassed 55 petabytes per month, more than double the 23 petabytes recorded in January 2001. (One petabyte equals 20 million four-drawer filing cabinets full of text.)
- The number of documents accessible over the Web doubled during the past 18 months, surpassing 3 billion.
- The number of U.S. adults connected to the Internet rose 5%, with 62% now connecting to the Internet at least three times in the past three months.

Internet experts see no end in sight to the network-of-networks' sprawl, especially in light of the new mobile devices hitting the market and the increasing popularity of broadband services.

"All I see is continuous, smooth growth," says Aristotle Balogh, vice president of engineering at VeriSign Global Registry Services, which handles all the look-ups for the .com, .net and .org domains. VeriSign saw its average daily traffic hit 4.6 billion queries in the third quarter of 2001, more than twice the 2.1 billion queries seen a year earlier.

"As more [handhelds] that can access the Internet are available, it's conceivable that the rates will continue to grow like this for the next three to four years," Balogh says. "By 2005, we expect 100 billion look-ups a day."

As the Internet gets larger, the percentage of growth in some areas is naturally slowing. And consolidation of Web sites and carriers is expected. But overall trends remain strongly upward.

"The Internet is still growing at 40% [annually for hosts]. . . . I'd take that as a healthy growth rate," says Dave Sincoskie, vice president of Internet architecture research at Telcordia, which tracks the number of host computers connected to the Internet."

The Internet's unstoppable spread comes as no surprise to network executives, who are struggling to meet their users' insatiable demand for Internet bandwidth and applications.

"We can never give our users enough [bandwidth]," says Jon Dolan, network engineering manager for Oregon State University, which supports 24,000 students and employees.

Oregon State leases two DS-3 lines, which offer a maximum bandwidth of 90M bit/sec. Oregon State uses a traffic-shaping device to restrict inbound Internet traffic to 22M bit/sec, up from 18M bit/sec a year ago. Oregon State sets no limits on outbound Internet traffic, which has exceeded 45M bit/sec on peak days.

"We took it to 22 megabits, which was all we could afford," Dolan says. If money wasn't a limiting factor, "we could easily drive 100 megabits."

Arlington Industries, a Libertyville, Ill., distributor of imaging supplies, saw its Internet traffic surge 25% in 2001. The company leases a T-1 line, half of which is dedicated to Internet traffic, while the other half carries frame-relay traffic. Internet traffic is growing even though the company restricts Internet access for its 150 employees to about 100 work-related Web sites.

What's spurring the rise in Internet traffic is the availability of new Internet-based applications, says net administrator Chris Kozlov. The company now offers VPN access from home and on the road, as well as Internet-based virus checking and credit reporting services. It also expanded its intranet with Web pages that point to hundreds of files.

With so much anecdotal and statistical evidence pointing to the Internet's continued growth, how did the shrinking Internet myth get started?

The first indication was a November report from SnapNames that showed the number of domain names registered in .com, .net and .org was declining. SnapNames reported domain name registrations peaked at 30.6 million in September 2001, dropping to 30.5 million in October and 30.2 million in November.

Market researcher Netcraft followed a few weeks ago with a report showing that the number of Web sites was declining along with domain name registrations. Netcraft said the number of Web sites fell by 182,142 from November to December, leaving a total of 36.2 million sites.

What appears to have happened last fall is many speculators who bought domain names in late 1999 did not renew their two-year registrations. Most of these names had one Web page attached to them — called a parking page — that announced the availability of the name for resale. So these names not being renewed doesn't necessarily mean fewer active Web sites.

"A lot of people were speculating on domain names and never using them. The number of unused domain names is what's shrinking," says Paul Mockapetris, chairman of Nominum, which creates software that runs on most of the Internet's domain name servers. "The number of names actually being used and the amount of traffic are continuing to go up."

Despite the recent decline in registrations, domain name registrars remain optimistic about the outlook for renewals and sales, particularly in new domains such as .info, .biz and .name.

Tucows' Noss predicts that domain name registrations will grow more than 10% in 2002.

"We expect pretty aggressive growth through 2005," Noss says. "People's use of the Internet is getting deeper and deeper. People sharing photos tracks to domain names. People sharing music tracks to domain names. People sharing e-mail tracks to domain names."

Indeed, VeriSign continues to report record-breaking domain name system queries. Most of the DNS traffic is corporate, with peak traffic as high as 13 billion look-ups per day coming during U.S. business hours, Balogh says.

Corporations also drive overall U.S. Internet backbone traffic, which has grown nearly tenfold in the past two years from 6 petabytes per month in January 2000 to 55 petabytes per month today. Among the applications driving corporate traffic are VPNs, telecommuting, videoconferencing and voice over IP.

"Enterprises that used to try to put their own T-1s to branch offices are now moving ever more to using virtual networks on top of the Internet or using the Internet directly," says John Quarterman, CTO of Matrix Net Systems, which sells Internet performance-monitoring tools. "That phenomenon hasn't slacked off."

AT&T has seen traffic on its IP network triple every year for the past three years.

"More enterprises are moving applications to the 'Net, and we'll continue to see that over the next couple of years," says Rose Klimovich, AT&T director of global IP network services. "We're seeing bigger sites with more traffic."

Most information on the Web comes from corporations, too. Marissa Mayer, product manager for search engine Google.com, estimates that half of the Web's 3 billion documents are on corporate Web pages. She says this number is growing quickly. "I don't expect it to taper off in 2002," she adds.

On the horizon is broadband access, which is a major multiplier for Internet traffic. Individual users typically increase their bandwidth 20 times when they migrate from a dial-up line to DSL or cable modem service.

Meanwhile, the number of broadband users is growing. Today, 11 million North American homes have broadband access — DSL or cable modem service — up 114% in the past year, according to Kinetic Strategies.

"When you see DSL sales have gone up by 3 or 4 million, that's like adding 80 million dial-up customers," Telcordia's Sincoskie says. And broadband access drives usage of bandwidth-intensive applications, particularly video. ■

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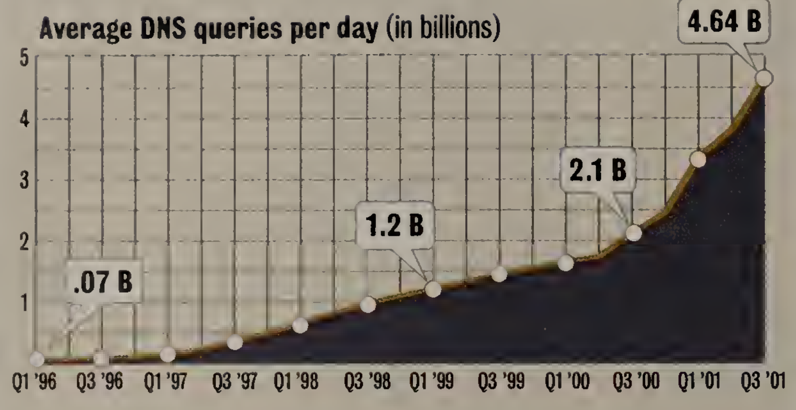
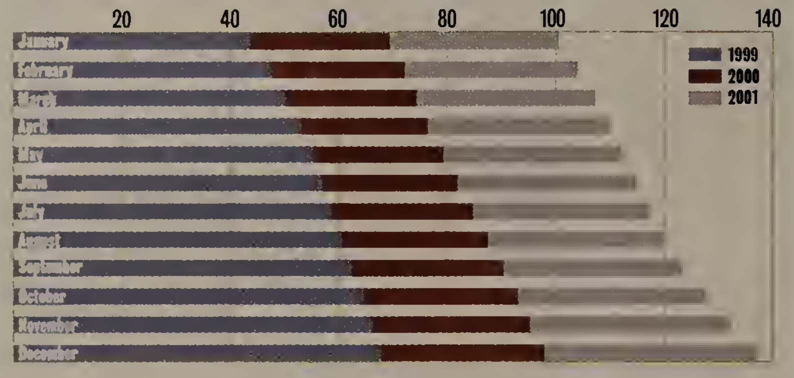
Internet's growth continues unabated



Average DNS queries per day (in billions)

SOURCE: VERISIGN



Host computers hooked up to the Internet (in millions)

SOURCE: TELCORDIA'S INTERNET SIZER

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Antivirus

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new viruses last year and such viruses are said to be costing companies billions of dollars on eradication efforts and in lost productivity, the virus writers haven't won this battle yet. Increasingly popular technology — dubbed behavior blocking — is starting to prove itself a worthy adversary.

"It did stop Code Red and Nimda," says Jay Ward, senior network security analyst for First Citizens Bank in Raleigh, N.C., which uses Entercept's behavior-blocking software to protect a Windows NT server running an online banking application.

Keeping count

Antivirus software vendor Sophos identified 1,000 new viruses last year, bringing the total to

71,000

known worldwide.

Behavior-blocking software runs on server and desktop computers, and is instructed through policies that network administrators set to let benign actions take place but to intercede when unauthorized actions occur. Unacceptable behavior can take the form, for example, of a program that attempts to mass mail itself or that rummages around in registries. Behavior-blocking software can set aside suspicious code in a so-called "sandbox," keeping it from causing harm while a network administrator decides whether the code is nefarious.

Behavior-blocking software is available primarily from small companies such as Okena, Entercept and Pelican Security. Analysts also mention Aladdin Knowledge Systems, Finjan, Granite Technology, Sandbox Security, Secure4You and even old-timer Harris as companies carving out niches in protection against malicious code.

So far, traditional antivirus software companies have shown little interest in behavior-blocking, which observers say may be a mistake.

"Based on signatures, antivirus software on the desktop is dying," says John Pescatore, an analyst with Gartner. "We need behavior-based interception."

Behave yourselves

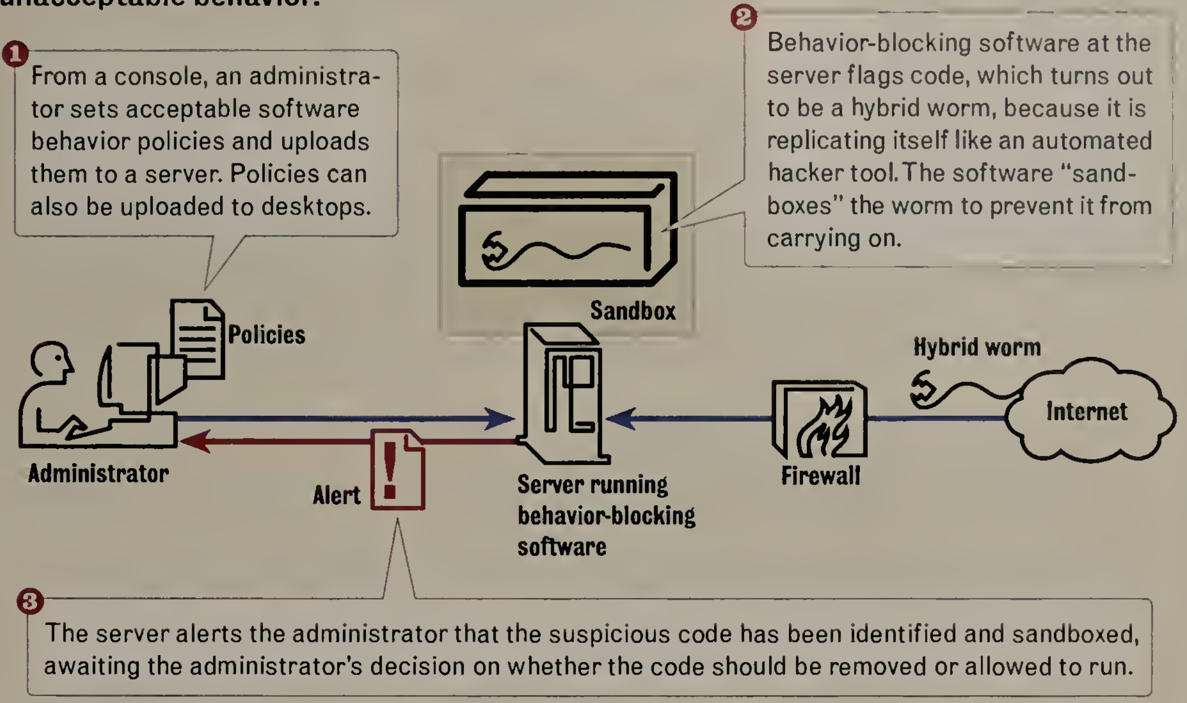
While customers say they aren't necessarily abandoning their signature-based antivirus software, they are starting to complement it with behavior-blocking products.

First Citizens Bank's Ward gave Version 2.0 of Entercept's behavior-blocking software a whirl after learning he couldn't patch known holes in the company's Microsoft servers without messing up an online banking application.

In mid-July, the Entercept software blocked and sandboxed unknown code it identified simply as a "Microsoft Directory Transversal Attack." By the next day, the world had identified the same code string as Code Red, Ward says.

How behavior-blocking software works

Unlike traditional antivirus software that requires "virus signature" updates to identify most new threats, behavior-blocking tools sniff out problem code by recognizing unacceptable behavior.



① From a console, an administrator sets acceptable software behavior policies and uploads them to a server. Policies can also be uploaded to desktops.

② Behavior-blocking software at the server flags code, which turns out to be a hybrid worm, because it is replicating itself like an automated hacker tool. The software "sandboxes" the worm to prevent it from carrying on.

③ The server alerts the administrator that the suspicious code has been identified and sandboxed, awaiting the administrator's decision on whether the code should be removed or allowed to run.

Still, First Citizens Bank isn't about to dispense with its traditional antivirus software, which Ward says is effective at removing known viruses and in cleanup when viruses make a successful strike. However, he pointed to at least one case in which running both behavior-blocking and antivirus software slowed down an NT server, which meant the antivirus software had to be turned off.

Hosted-service provider Corio is also sold on behavior-blocking software, which it used to stop Code Red and Nimda.

"We use the software as a layer of prevention," says Mark Milatovich, Corio's director of security. "The current model of the world — the antivirus model at the gateway, server, mail exchange and desktop — is a cat-and-mouse scenario. Antivirus software is only as good as those signatures. There's a window of exposure even with due diligence. We need prevention because these worms will get nastier."

Staying the course

In spite of such evidence that behavior-based software works, traditional antivirus vendors are largely ignoring the technology. Computer Associates, Network Associates, Sophos and Symantec say their tools will remain signature-based for the foreseeable future. Among other things, they point out that behavior-blocking software isn't geared toward eradicating viruses.

"For the foreseeable future, it's a matter of how up to date are you with signatures," says Sam Curry, McAfee.com's security architect.

While some vendors give behavior-blocking tools a modicum of respect, others are more critical.

"It brings a higher degree of false positives," says Vincent Werf, Symantec's senior director of security response. Symantec touts the "heuristics" capabilities in its Norton Antivirus products as able to detect some unknown viruses without signature, but Werf admits that heuristics didn't detect or stop Code Red or Nimda.

Challenges acknowledged

Even behavior-blocking product vendors say using their wares can be challenging. For one thing, it can be tricky to devise policies that ensure the software can distinguish between good and bad behavior.

"It's difficult to write generic rules that screen valid requests for data from invalid attacks," says Chad Harrington, product director at Entercept.

Behavior-based software also asks a company's IT administrators to be arbiters of whether suspect code, once it is flagged, is actually bad. Not only does this put an administrator on the spot, it could create a delay in action being taken.

But some customers are eager to give the software a chance.

"Behavior-blocking technologies could be easier to manage" because they don't require signature updating, says David Yaacobi, manager of information services at El Al Airlines. The company just deployed Sanctum's AppShield software to keep hackers from getting into its network through a public Web server and is investigating software from Pelican to help guard the airline's desktops.

Interestingly, although behavior-blocking software can stop harmful worms, most vendors that make it are reluctant to press their wares as a substitute for traditional antivirus code. "We don't protect against viruses, such as disk viruses not introduced from the Internet," says Gilad Golan, Pelican's president.

"We don't replace an antivirus product," Entercept's Harrington says. "The best way to stop intrusions is through both, because not all attacks can be detected through behavorial rules."

Ultimately, network executives have to decide whether they are willing to pay for behavior-blocking software, especially where it is seen as being merely complementary to traditional signature-based antivirus or intrusion-detection software that companies may already be spending $25 or more on per desktop. Behavior-blocking software costs roughly $50 or $60 per desktop and between $1,000 and $1,600 per server. ■

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SuperNet

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softswitches, said Ron Westfall, an analyst at Current Analysis. That's where quantifiable QoS and SLA metrics that can be guaranteed come in, he said.

"SLAs are a key part of all of our products," said Eric Borzich, vice president of IP services at Qwest Communications. "But they have a long way to go. The Internet is a network of networks. SLAs have to exist on an internetwork basis. There's lots of room for improvement there."

Service providers say they can adequately measure and guarantee availability as well as minimal latency, packet loss and jitter on an intranetwork basis. But complicated business and peering arrangements between service providers have to be hammered out, and continuous improvements to vendor products — including interoperability — have to be made to guarantee QoS and SLAs for IP across networks, Borzich said.

"We need a model that operates [the way] voice networks operate together, where handoffs are transparent to the end user," Borzich said. "QoS and [SLA] enforcement place requirements on the carrier to do things they don't do today." ■

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BackSpin Mark Gibbs

Sex, likely lies and software

> "The patterns in people's language change when they are uncertain or lying. We can compare basic patterns in words and grammatical structures vs. benchmarks to detect likely lies."

Peter Dorrington, business solutions manager at SAS, quoted in the *London Financial Times*, Jan. 20 (www.nwfusion.com, DocFinder: 7849).

If I understand this correctly (and there's not a whole lot of additional information available about this product), the SAS software compares your patterns of language use in e-mail messages to norms and can determine if you are telling untruths by looking for deviations. . . . Interesting.

Clues to the kind of algorithmic hocus-pocus under the hood comes from a news item in Newsscan (www.newsscan.com), which cites the following from Aldert Vrij's book, *Detecting Lies and Deceit:* "For instance, overuse of the word 'or' and too many adjectives can be giveaways."

Apparently the scanning process is very fast and detects not only lies but also uncertainty. Thus, if you know you didn't actually solve the problem of why the CEO's computer keeps crashing, or even if you think you might have but aren't sure, with this software watching your e-mail or scanning your trouble-ticketing system, you will be fingered.

The product, which SAS announced on Jan. 21 under the name Text Miner, can sift through e-mail and text files to "identify trends and create more actionable results for management" (www.nwfusion.com, DocFinder: 7850).

What is really interesting is that it heralds a new age in employee monitoring. To date, e-mail monitoring has been, in the main, about blocking dirty words and verboten URLs. There have been attempts at detecting "adult" pictures in e-mail, aka "fleshspotting," but I've heard of nothing that is really worth using (see www.nwfusion.com, DocFinder: 7851 and DocFinder: 7852).

Anyway, the whole idea of paying attention to tone, context and intention in e-mail is wild. Usually we've just looked for and acted on the anomalies — you know, the accountant who was running a spam factory sending out a million messages per day whom you detected because he got more than his usual quota of "bounces" in a week.

But now we can know when our people are lying in messages traveling up and down the corporate hierarchy, as well as when we're lying to our customers and when our customers are lying to us. And the guardians who run the detection software will know all kinds of interesting things (IT Tech No. 1: "Hey, you know Bill in Engineering? He's cheating on his wife again — the detector says so." IT Tech No. 2: "Same old — give him the usual blackmail price. He's a good customer.").

Of course, this kind of analysis is subject to false positives. The implications and consequences could be serious. You could conceivably lose your job or status over something you never did.

I can foresee a great business here: There's going to be a huge number of people who want to ensure that their messages aren't flagged as lying or whatever they're trying to avoid (even when they are, in fact, doing exactly what they don't want to be found to be doing). Thus, we set up a service on the Internet to clean messages.

We buy a copy of the SAS software and for a reasonably hefty fee we run people's messages through the mill and determine what will raise warning flags. For an additional charge we suggest corrections, and there's a premium "rush" service for press announcements and urgent responses to your boss.

We'll need a few million to get this off the ground so let me know if you're in and for how much. Send me the money and let's get rockin'! I smell riches beyond my wildest dreams! <<NW Message Scanning System: This message has been found to contain indications of uncertainty and untruth. Further detail may be found in the log.>>

Truth or dare to nwcolumn@gibbs.com.

'NetBuzz News, insights, opinions and oddities

Paul McNamara

Op40 tells a nice story, if anyone's listening

The world may still beat a path to your door for a better mousetrap, but multimillion-dollar software systems are a tougher sell in these days of budget cutbacks and hazy prospects for an improved economy.

"It's not the best time to try to get the customers to pay you something," understates Shuang Chen, a former IBM researcher and the founder of Op40, which makes software that manages the distribution and accelerates the execution of applications over the Internet.

But that isn't stopping Op40 from pitching the initial version of Distributed Internet Server (DIS) to large corporations — airlines, financial institutions, retailers — that want to push more than simple static content out to the network edge and closer to customers or employees. According to Chen, DIS moves far beyond the capabilities offered by content-delivery networks such as Akamai by also facilitating the efficient transfer of full application features from a customer's host computer to an edge server in a branch office or even a desktop.

Op40 has pilots working with Boeing (honest, no pun intended) and a group of New York City grocers, and Chen says interest is picking up among potential customers, primarily because Op40 has enough confidence to offer free trials.

"The application performance is guaranteed, and the user is happier," Chen says. "It also dramatically off-loads [traffic] from the central server and the network. The data going back and forth is dropped to a minimum."

DIS requires no hardware or systems upgrades, Chen says, and it can be dropped onto your network with minimal fuss.

Sounds appealing. . . . Now all he has to do is pry open a few checkbooks.

Why Amazon's fortunes matter

You may have noticed that Amazon.com posted its first quarterly profit last week. The company opened for business in July 1995.

About time, no?

And let's not quibble about the guidance that accompanied Amazon's report, which, when translated into English, amounted to "Don't count on us to do this again next quarter." Or that the profit was only $5 million, a penny per share. Or that the meager gain was made possible by deep price cuts and expense reductions, which do not necessarily translate into long-term financial stability.

Qualifiers aside, it seems to me that you almost have to root for these guys.

Think about it: If two or three years down the road Amazon.com — with all of its brand recognition, loyal customers and gross revenue — is *not* a huge success, what's the likelihood that retail e-commerce in general will be?

More about that Dell dude

A New Year's resolution to "slap the silly grin off" the mug of that surfer dude who does the Dell commercials was expected to generate a complaint or two from sourpusses who would take the threat of violence literally.

That didn't happen. Instead, I received a handful of heart-warming e-mails from like-minded sorts who wanted me to give the kid a slap in their behalf, too.

However, not all of the responses were that encouraging. Network World Fusion guru Adam Gaffin flagged a positively glowing profile of the young man — Ben Curtis is his name — that graced the pages of the generally more levelheaded *Wall Street Journal*.

Worse yet, this annoying Curtis fellow has engendered a cult following on the 'Net. Witness this pair of fan sites: www.nwfusion.com, DocFinders: 7853 and 7854.

If you have teenage daughters, be afraid, be very afraid.

Want to slap a columnist around? The address is buzz@nww.com.

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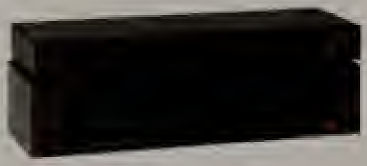

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- Multi-platform models converts PC, Unix, Apple, or Sun keyboard and mouse data to any platform
- Built in daisy-chaining to support up to 256 computers

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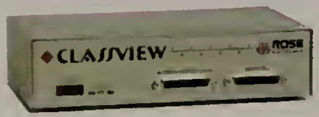

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- Video resolution up to 1600 x 1280
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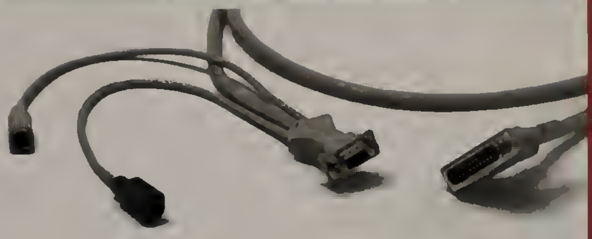

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For greater distance, see CrystalView.

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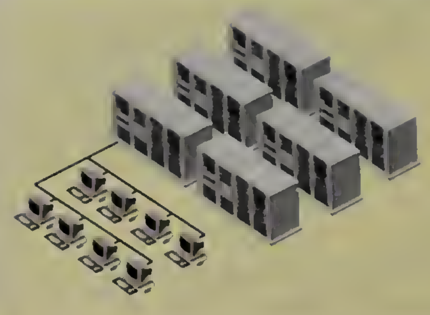

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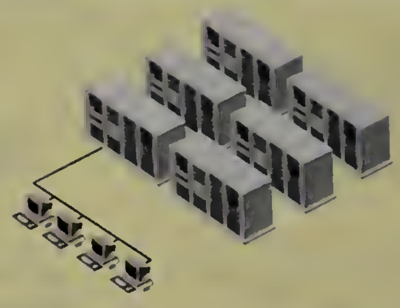

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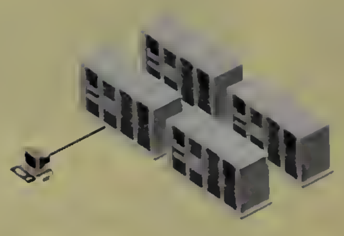

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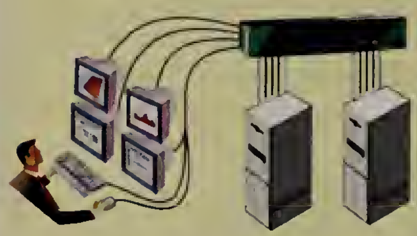

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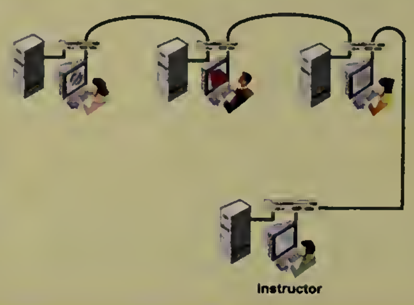

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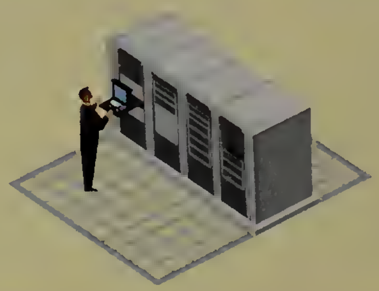

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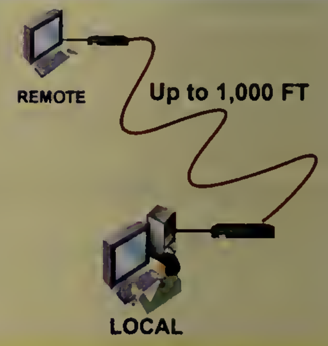

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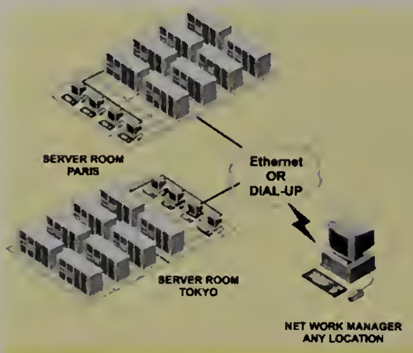

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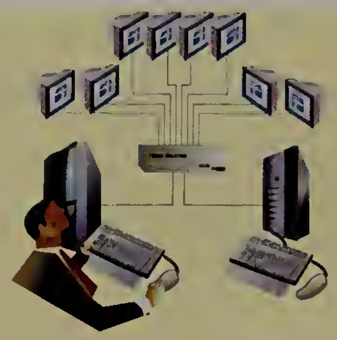

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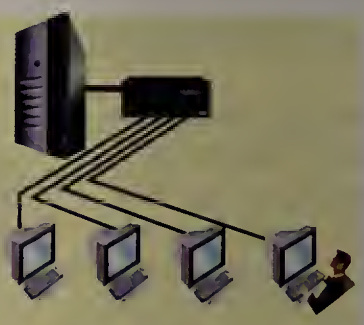

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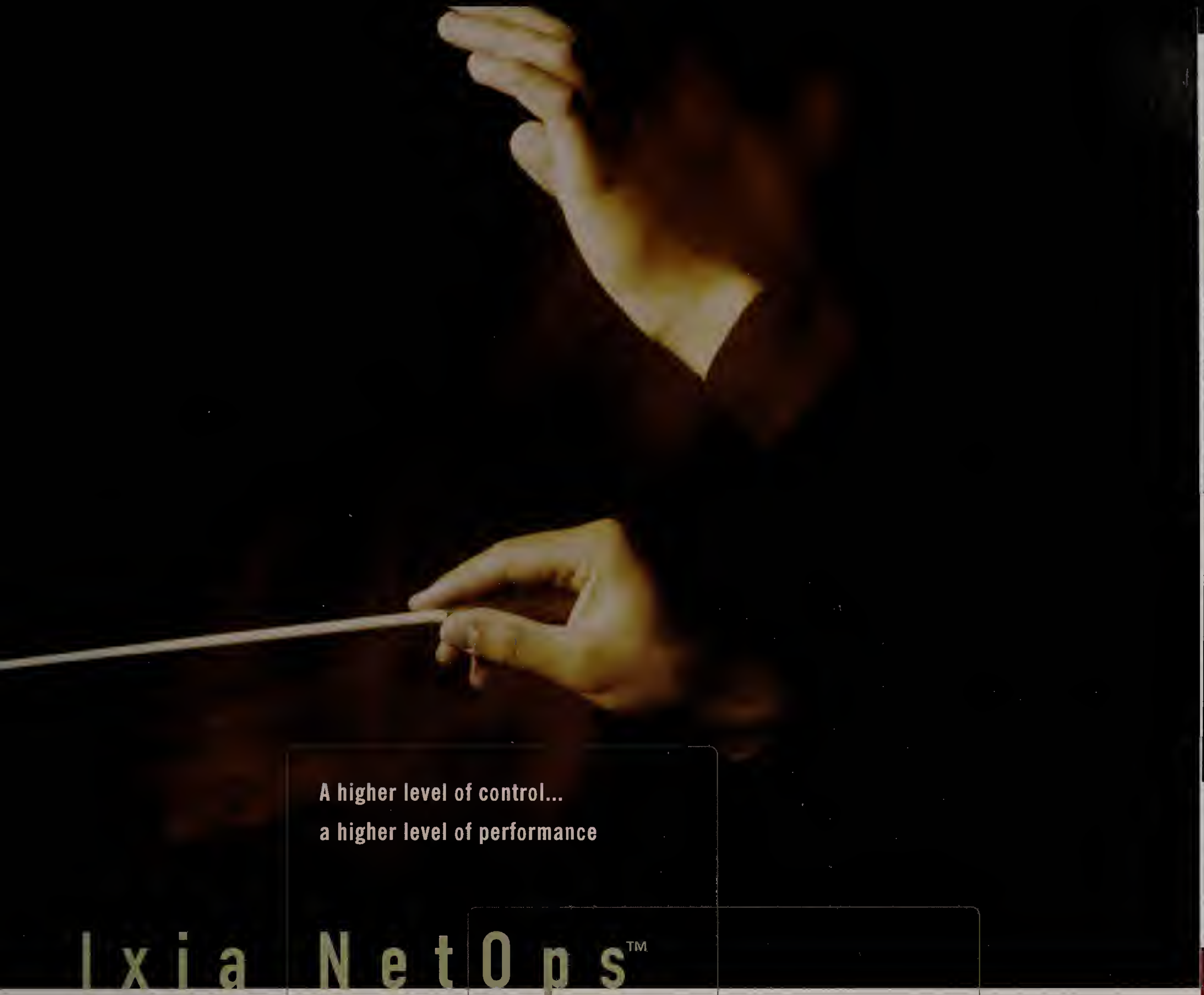

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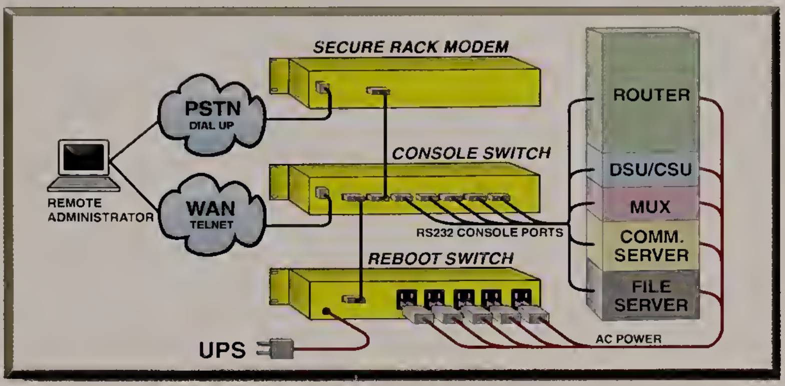

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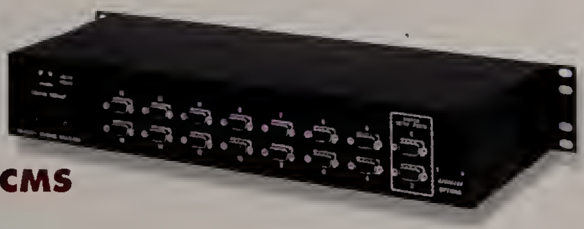

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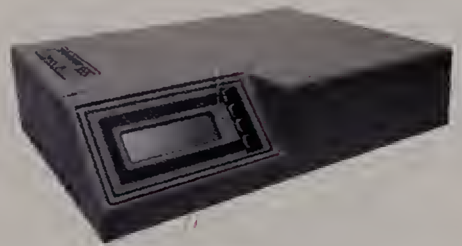

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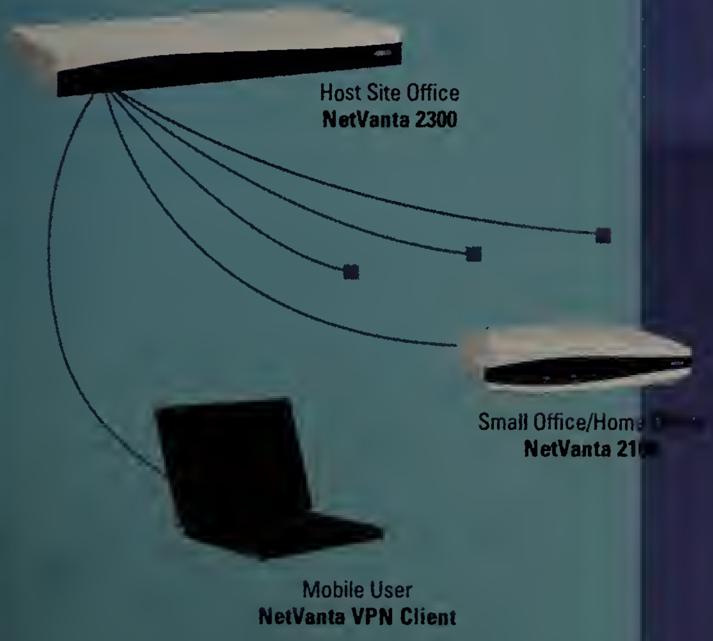

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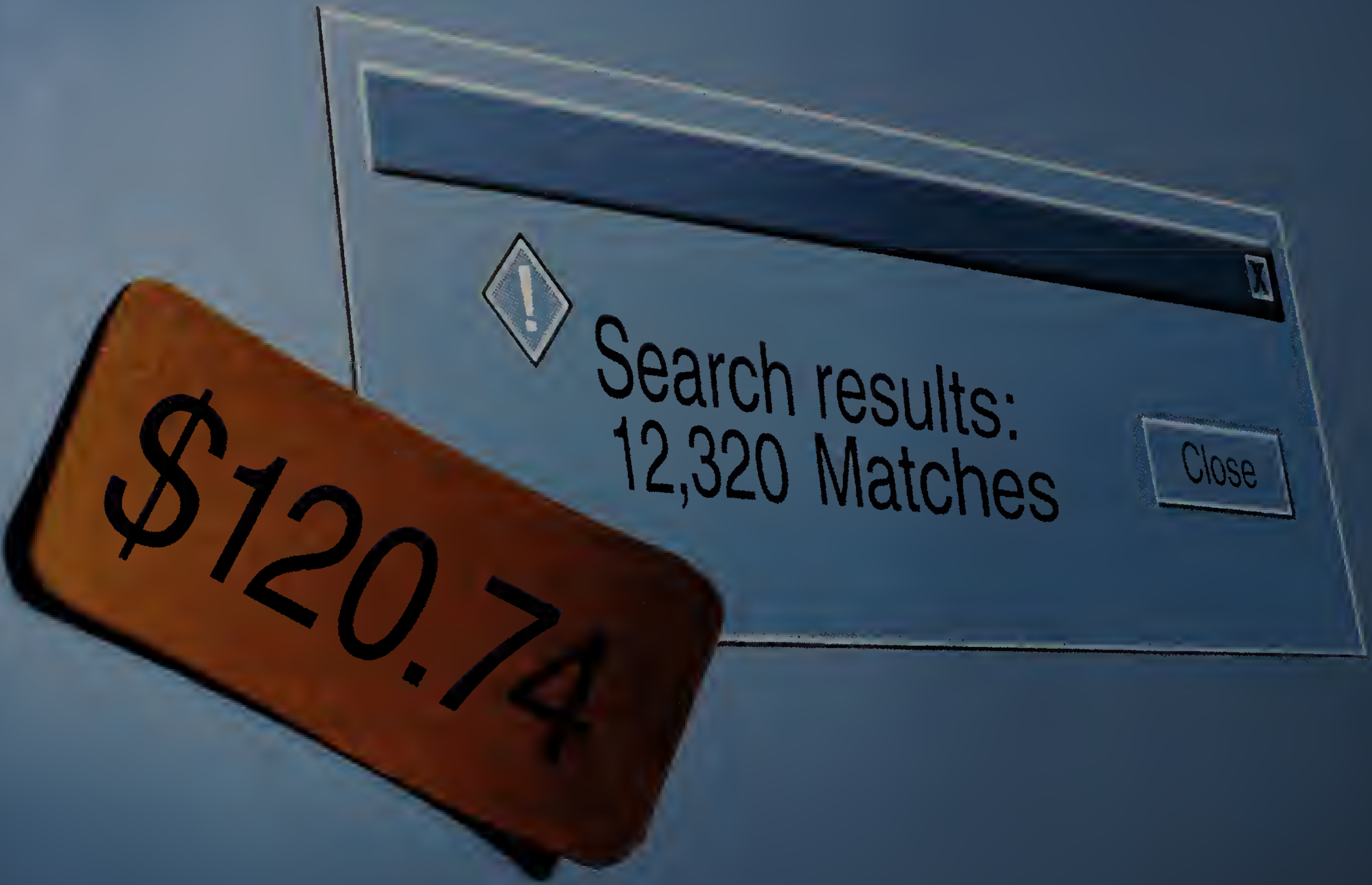

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